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Developing Sectoral Mechanisms in the Transition Period towards a New Climate Treaty

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Developing Sectoral Mechanisms in the Transition Period towards a New Climate Treaty

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Kurzbeschreibung

Ziel dieses Forschungsvorhabens ist die Untersuchung von sektoralen Ansätzen in einem internationalen Regime der Klimapolitik, mit Fokus darauf eine Brücke zwischen existierenden und zukünftigen Mechanismen und Instrumenten zu schlagen. Hierfür analysieren wir zunächst die Diskussionen und Entwicklungen zu sektoralen Ansätzen in bestehenden und zukünftigen UNFCCC-Mechanismen. Das Vorhaben untersucht, welche sektoralen Ansätze unter NMM oder NAMAs angewendet werden könnten. Die Analyse basiert auf einem breiten Set von Untersuchungsindikatoren. Dazu werden die von Vertragsstaaten bei der UNFCCC eingereichten Vorschläge ausgewertet und eine quantitative Analyse der CDM-, PoA- und NAMA-Pipeline vorgenommen. Die Analyse wird gestützt von Interviews mit UNFCCC-Verhandlungsteilnehmern, Vertretern der Wissenschaft und Kohlenstoffmarktakteuren. Eine Betrachtung von potenziellen Barrieren für die Einführung sektoraler Ansätze und die Entwicklung entsprechender Lösungsvorschläge, sowie abschließende Empfehlungen runden die Studie ab.

Abstract

This study analyses how sectoral approaches are evolving in existing and future mitigation mechanisms, and how they can help shaping the transition period to a new climate regime most effectively. The analysis is based on an evaluation of recent UNFCCC submissions, a desk review of the relevant literature and databases, as well as a set of semi-structured expert interviews. The desk review is complemented by an analysis of a set of indicators regarding the potential of the identified sectoral elements standardized baselines, programme of activities, sectoral crediting and trading, as well as domestic policy instruments for NMM/FVA and NAMAs, by differentiating and structuring the analysis according to various institutional, technical and political aspects. A reflection of relevant barriers for adoption of sectoral approaches, as well as opportunities to overcome them is provided together with a set of recommendations for political decision makers.

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List of abbreviations

ADP	Ad Hoc Working Group on the Durban Platform for Enhanced Action
A/R	Afforestation / reforestation
AOSIS	Alliance of Small Island States
AR	Assessment report
BAU	Business As Usual Scenario
BRIC	Brasilia, Russia, India, China
BURs	Biennial update reports
CCS	Carbon Capture and Storage
CDM EB	Clean Development Mechanism Executive Board
CDM	Clean Development Mechanism
CERs	Certified Emission Reductions
CFL	Compact fluorescent lamps
Ci-Dev	Carbon Initiative for Development
CME	Coordinating and Managing Entity
CMP	The Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CO₂	Carbon Dioxide
COP	Conference of the Parties
CPA	Component Project of Activities
DEHSt	Deutsche Emissionshandelsstelle
DNA	Designated National Authority
DOE	Designated Operational Entities
EB	Executive Board
EE	Energy efficiency
ERPA	Emission reductions purchase agreements
EU	European Union
EU ETS	European Union Emissions Trading Scheme
FVA	Framework for various approaches
GCF	Green Climate Fund
GEF	Global Environmental Facility
GHGs	Greenhouse Gases
h	hours
HFC	Hydrofluorocarbons

ICA	International Consultation and Analysis
IET	International Emissions Trading
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
ITL	International Transaction Log
JCM	Joint Crediting Mechanism
JI	Joint Implementation
KP	Kyoto Protocol
LCA	Long-term cooperation action
LDC	Least Developed Country
LED	Light-emitting diode lamp
LoA	Letter of Approval
M&P	Modalities and Procedures
MCEE	Mechanism for Carbon-Efficient Economies
MDB	Multilateral development banks
MM	Market Mechanism
MRV	Measurement, Reporting and Verification
MWh	Megawatt hours
NAI	Non-Annex-I countries
NAMA	Nationally Appropriate Mitigation Action
NMM	New Market Mechanism
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PMR	Partnership for Market Readiness
PP	Project Participant
QA/QC	Quality assurance and quality control
RBF	Results-based finance
RCC	UNFCCC regional CDM collaboration centres
R&D	Research and Development
REDD	Reducing Emissions from Deforestation and Degradation
S-CDM	Sectoral CDM
SB	Standardized baselines
SBSTA	Subsidiary Body for Scientific and Technological Advice
SCM	Sectoral crediting mechanism
SD	Sustainable Development

SSC	Small scale
STM	Sectoral trading mechanism
t	metrical tonnes
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Programme
US	United States of America
VCS	Verified Carbon Standard
WCI	Western Climate Initiative

Zusammenfassung

Hintergrund und Ansatz

Ziel dieses Forschungsvorhabens ist die Untersuchung von sektoralen Ansätzen in einem internationalen Regime der Klimapolitik, mit Fokus darauf eine Brücke zwischen existierenden und zukünftigen Mechanismen und Instrumenten zu schlagen. Hierfür analysieren wir zunächst die Diskussionen und Entwicklungen zu sektoralen Ansätzen in bestehenden und zukünftigen UNFCCC-Mechanismen. Sektoriale Ansätze für den CDM werden seit Einführung des Mechanismus diskutiert, und haben sich in Form von programmatischem CDM (PoA) und standardisierten Baselines (SB) bereits etabliert bzw. werden als ernsthaftes Reforminstrument des Mechanismus verstanden. Unter dem Neuen Marktmechanismus (NMM) und dem Framework for Various Approaches (FVA) werden zudem Ansätze zukünftiger marktbasierter Mechanismen diskutiert. Die konkretesten Ansätze stellen hier sectoral crediting und trading dar. Zudem diskutiert die internationale Gemeinschaft die Rolle von bereits existierenden nationalen Verminderungsmaßnahmen (NAMAs) in diesem Kontext, unter welchen diverse nationale Politikmaßnahmen gefasst werden können. Das Vorhaben untersucht, welche sektoralen Ansätze unter NMM oder NAMAs angewendet werden könnten. Die Analyse basiert auf einem breiten Set von Untersuchungsindikatoren. Dazu werden die von Vertragsstaaten bei der UNFCCC eingereichten Vorschläge ausgewertet und eine quantitative Analyse der CDM-, PoA- und NAMA-Pipeline vorgenommen. Die Analyse wird gestützt von Interviews mit UNFCCC-Verhandlungsteilnehmern, Vertretern der Wissenschaft und Kohlenstoffmarktakteuren. Eine Betrachtung von potenziellen Barrieren für die Einführung sektoraler Ansätze und die Entwicklung entsprechender Lösungsvorschläge, sowie abschließende Empfehlungen runden die Studie ab.

Potenzielle sektorale Ansätze

Der programmatische Ansatz im CDM, **PoA**, konnte sich als fester und relevanter Bestandteil des CDM etablieren. Insbesondere hinsichtlich der sektoralen und geographischen Ausdehnung des CDM spielen PoAs mittlerweile eine zentrale Rolle, beispielsweise in Afrika. Dabei kommen einige PoAs bereits nah an eine sektorweite Ausdehnung von Minderungsaktivitäten heran, sollten sie vollumfänglich umgesetzt werden. Insgesamt genießt das PoA Konzept eine hohe Akzeptanz, auch über den CDM hinaus.

PoAs sind als Instrument sowohl unter dem NMM als auch unter NAMAs grundsätzlich möglich. Im Gegensatz zur CDM Standardisierung benötigen PoAs deutlich weniger Aufmerksamkeit und Einbindung der Regierung im Gastgeberland. Dieser Umstand dürfte sich unter dem NMM oder NAMAs ändern, da hier eine deutlich stärkere Rolle für nationale Autoritäten im Gastgeberland vorgesehen ist, welche nicht zuletzt erhebliche Kapazitäten binden dürften. Andererseits kommt etwa der CDM Policy Dialogue zu dem Schluss, dass eine Kombination von PoAs mit SBs eine schlagkräftige Option für zukünftige Mechanismen darstellen kann, insbesondere hinsichtlich einer simplifizierten Anwendbarkeit auch von sektorweiten Aktivitäten (im weiteren auch als "CDM+" Option bezeichnet). Gleichwohl sind noch fundamentale Anpassungen des PoA Konzeptes notwendig, insbesondere auf institutioneller Ebene mit Hinblick auf die Übertragung des zentralen PoA Koordinators und der einzelnen Projektpartner auf das Konzept sektoraler Ansätze unter dem NMM. Hier müssten zum Beispiel die Verantwortlichkeiten von der PoA Koordination auf die Ebene der Regierung verlagert werden, was eine Reihe von Herausforderungen hinsichtlich Kapazitäten, Verwaltungsarchitektur und Anreizstruktur hervorbringen würde.

Ein weiterer sektoraler Ansatz unter dem CDM ist die Einführung so genannter **standardisierter Baselines**. SBs berücksichtigen Daten eines breiten Spektrums oder gesamten Sektors, und haben das Potenzial grundsätzlich für alle zulässigen CDM Aktivitäten in dem Bereich, Sektor oder Land anwendbar zu sein. Der Standardisierungsprozess steckt gleichwohl noch in den Kinderschuhen und wird sich in den kommenden Jahren weiter entwickeln; insbesondere das Verhältnis von Umweltintegrität und erwünschten niedrigen Transaktionskosten steht hierbei im Vordergrund.

SBs sind grundsätzlich ein sehr gut passendes Instrument für den Einsatz unter NMM oder NAMAs, da sie primär als aggregiertes Konzept gedacht sind, und nicht einzelne Projekte berücksichtigen. Es ist aber zu berücksichtigen, dass sich durchaus Unterschiede bezüglich der zukünftigen Anwendbarkeit von SBs unter NMM oder NAMA ergeben, in etwa hinsichtlich des Zentralisierungsgrades oder regulatorischen Anforderungen. Bezüglich Kapazitätsanforderungen oder Indikatoren für Transaktionskosten muss zwischen Akteursgruppen unterschieden werden, da etwa Standardisierung für Marktakteure auch mit erhöhten Transaktionskosten, und für Gastgeberländer mit komplexeren Kapazitätsanforderungen einhergehen kann.

Hinsichtlich **zukünftiger Mechanismen** werden sektorale Ansätze erörtert, die im Rahmen der UNFCCC Verhandlungen zu NMM, FVA und NAMAs diskutiert werden. Hierbei werden eher politikbasierte Ansätze, welche unter dem CDM bislang keine Rolle spielen, reflektiert. Die relevantesten Ansätze dabei sind **Sectoral Crediting** und **Sectoral Trading** unter dem NMM. Crediting und Trading sind beide eher für Anwendungen mit sehr breitem Spektrum erdacht (sektorweit, landesweit), und eignen sich daher per se als sektoraler Ansatz, was sich auch in den EU Vorschlägen für sectoral crediting und trading niederschlägt. Die regulatorischen und administrativen Anforderungen sind hierbei insbesondere auf internationaler Ebene, aber auch auf Ebene der Landesregierung signifikant. Anlagenbetreiber sind hingegen weniger direkt beeinflusst, obgleich sie natürlich sämtliche nationale Politikmaßnahmen welche durch die Mechanismen angereizt und umgesetzt werden „erfahren“. Crediting und – zu einem noch höheren Grad – Trading stellen hohe Anforderungen an die Qualität der verfügbaren Daten. Die derzeitigen Vorgaben zur Berichterstattung unter ICA und im Rahmen von BURs müssen ihre Praxistauglichkeit erst noch unter Beweis stellen. Es scheint daher wahrscheinlicher, dass sowohl crediting als auch trading eher unter einem zentralistisch organisiertem Mechanismus wie dem NMM eingesetzt werden, zumal NAMAs bislang keine Zertifizierung und Handelbarkeit von THG Emissionen zulassen.

Im Rahmen zukünftiger Mechanismen und NAMAs werden die Regierungen der Gastgeberstaaten eine herausragende Rolle tragen müssen, deutlich stärker als heute unter dem CDM. Dies ist insbesondere dadurch bedingt, dass die Regierungen **nationale Politikmaßnahmen** zur THG Reduktion konzipieren und diese auch umsetzen müssen. Im Vergleich werden striktere internationale Vorgaben unter einem zentralistisch organisierten NMM wahrscheinlich besser Umweltintegritätsstandards erfüllen können. Gleichwohl existiert weder der NMM noch ein FVA bislang. Im Gegenzug sind NAMAs ein bereits definiertes und angewandtes Instrument – nahezu jede beliebige Politikmaßnahme kann heutzutage als NAMA deklariert werden (im Rahmen der UNFCCC Vorgaben). Allerdings fehlen noch ausreichend monetäre Anreize für eine stärkere Ausbreitung des NAMA Konzepts.

Barrieren für die Umsetzung

Auf Basis der Ergebnisse der analytischen Untersuchung identifiziert das Vorhaben Schlüsselbarrieren, welche der Umsetzung sektoraler Ansätze entgegenstehen, und formuliert Lösungsvorschläge um diese Barrieren zu überwinden. Für jeden untersuch-

ten Ansatz werden hierbei die Akteursgruppen “UNFCCC”, “Nationale Regierungen”, und “Marktakteure” betrachtet. Aufgrund des noch sehr vagen Charakters sektoraler Ansätze sind die identifizierten Lösungsansätze für einzelne Barrieren sehr allgemein, und sollten daher eher als Diskussionsgrundlage dienen.

Identifizierte Herausforderungen oder Barrieren für die UNFCCC Ebene umfassen die Erstellung von Vorschriften und Normen, die Ausstellung von Zertifikaten, eine mangelnde Klimaschutz-Mechanismus "Infrastruktur", den Mangel an Nachfrage und Marktaufsicht sowie ein "institutionelles Vakuum" im Umgang mit Preisvolatilität von Zertifikaten. Herausforderungen für nationale Regierungen umfassen die nationale Umsetzungsarchitektur, Aspekte der Anreizsetzung sowie Strukturen für die Zertifikatsausstellung. Herausforderungen für die Marktteilnehmer betreffen die Anreizstruktur für die Teilnahme an Minderungsaktivitäten, Investitionssicherheit, die Praktikabilität der sektoralen Ansätze sowie Kapazitätsengpässe bei den Marktteilnehmern.

Ergebnisse

Sobald die Landschaft zukünftiger Mechanismen der Klimapolitik auf internationaler Ebene deutlicher erkennbar wird, wird sich eine relevantere Rolle nationaler Politikmaßnahmen in einem zukünftigen Klimaregime abzeichnen. Aus heutiger Sicht scheint sich das Spektrum sektoraler Ansätze, welche zuvor diskutiert wurden, eher für eine Anwendung unter NAMAs zu qualifizieren. Auch erscheint die Entwicklung von Ansätzen unter einem ergebnisorientierten Finanzierungsansatz (Results-Based Finance, RBF) möglich (was eine Deklaration als NAMA nicht ausschließt).

In der Entstehung befindliche sektorale Ansätze werden differenzierter ausgestaltet sein als der heutige CDM. Beispielsweise kann hier neben einem multilateralen Marktmechanismus auch eine Anzahl verschiedenster sektor-spezifischer Mechanismen eingeführt werden. In diesem Kontext, und um der Vielfalt an sektoralen Ansätzen und den jüngsten Entwicklungen Rechnung zu tragen, schlagen wir eine überarbeitete Terminologie für sektorale Ansätze vor:

- **Sektor-orientierte Ansätze:** Diese Ansätze beziehen sich auf gesamte Sektoren oder Subsektoren, indem beispielsweise die Anwendung einer standardisierten Baseline verpflichtend gemacht wird. Diese Ansätze basieren weiterhin auf einem Crediting-Prinzip und können Projekte, Programme aber auch Politikmaßnahmen umfassen. Aufgrund ihres unverbindlichen Charakters decken sie jedoch nicht notwendigerweise alle Emittenten eines Landes oder Sektors ab.
- **Sektorweite Ansätze:** Diese Ansätze weiten Klimaschutzaktivitäten aus, indem gesamte Sektoren oder Subsektoren abgedeckt werden. Durch die verpflichtende Teilnahme ist hier die Abdeckung des entsprechenden subnationalen, nationalen oder regionalen Bezugsrahmens gewährleistet. Ein mögliches frühes Beispiel für einen solchen Ansatz könnte ein NMM sein, welcher die Erfassung etwa emissionsintensiver Industrien unter dem NMM abdeckt.
- **Sektorspezifische Ansätze:** Diese dritte Kategorie bezieht sich auf Mechanismen, die für auf die Erschließung der Emissionen in einem bestimmten (Sub-) Sektor oder einer Technologie (auch länderübergreifend) entwickelt wurden. Beispiele hierfür sind REDD+, oder ein Mechanismus, der die Reduktion von HFC-Emissionen zum Ziel hat. Diese Mechanismen können in ihrem Geltungsbereich beträchtlich variieren, gemeinsam ist ihnen jedoch ein hohes Potential für die Erzielung von Netto-Emissionsreduktionen unter der Vo-

raussetzung, dass der Offsetting-Ansatz überwunden wird, also die ausgestellten Zertifikate den Käufer berechtigen, zusätzliche Treibhausgase zu emittieren.

Diese überarbeitete Terminologie soll die Einordnung bestehender sowie neuer Mechanismen und Konzepte erleichtern. Der verfeinerte Blick auf die Gemeinsamkeiten und spezifischen Unterschiede könnte zudem die Diskussionen über neue Marktmechanismen und über die Frage der Gestaltung des Übergangs vom CDM zu selbigen voranbringen.

Für den CDM zeigen die Ergebnisse, dass sich einige sektorale Elemente wie PoAs und standardisierte Baselines von der theoretischen Diskussion loslösen konnten und in die Umsetzung gelangt sind. Für eine weitergehende sektorale Ausdehnung des CDM ist die Reform zahlreicher CDM-Elemente voranzutreiben, darunter insbesondere die Standardisierung von Baselines, Verfahren zum Nachweis der Zusätzlichkeit sowie MRV. Werden diese mit dem programmatischen Ansatz kombiniert, könnte der CDM weiter in Richtung eines sektoralen Mechanismus' ausgebaut werden.

Dabei hängt die Entwicklung von vielen Faktoren ab, unter anderem die Entwicklung der UNFCCC Verhandlungen oder der weiteren Ausgestaltung der Architektur für Klimafinanzierung in Verknüpfung mit dem Kohlenstoffmarkt (z.B. durch RBF). Solche Ansätze gibt es bereits etwa im Rahmen von REDD+ oder unter dem Green Climate Fund. Unter dem CDM können CERs mittlerweile freiwillig gelöscht werden, was etwa im Rahmen eines Interviews als ideale Basis für einen sektoralen Ansatz mit Nettominderungseffekt vorgeschlagen wird.

Diese Diskussionen werden in Zukunft an Relevanz gewinnen, da Akteure in Entwicklungsländern, sowohl im privaten als auch im öffentlichen Sektor (also auf Regierungsebene) Minderungsaktivitäten in entsprechender Größenordnung nicht ohne internationale finanzielle und technische Unterstützung stemmen werden können.

Die Studie wertet die aktuellen Entwicklungen bezüglich sektoraler Ansätze aus, kann aber gleichzeitig bestimmte Aspekte wie den Mehrwert eines NMM gegenüber einem CDM+ Ansatz nicht abschließend beurteilen. Dazu gehört auch, Lösungsansätze für die Lösung der festgefahrenen Klimaverhandlungen zum NMM auf UNFCCC Ebene zu erarbeiten. Hier muss eher eine entsprechende Anreizstruktur untersucht werden, welche Entscheidungsträger und Marktakteure zu transformativem Verhalten in entsprechenden Sektoren anhält. Die Studie schließt daher mit einer Reihe von Empfehlungen hinsichtlich weiteren Forschungsbedarfs und potenziellen Vorschlägen für die UNFCCC Debatte.

Summary

Background

This study analyses how sectoral approaches are evolving in existing and future mitigation mechanisms, and how they can help shaping the transition period to a new climate regime most effectively. For years, there has been a discussion on how the CDM can evolve from a project-based approach towards a more comprehensive or sectoral scope. Important existing developments in this direction are CDM Programme of Activities (PoA) and standardized baselines (SB). Regarding emerging market mechanisms, the Conference of the Parties (COP) 17, in 2011, established the New Market Mechanism (NMM) and the Framework for Various Approaches (FVA), which may serve as potential vehicles for sectoral approaches in the future. In addition, Nationally Appropriate Mitigation Actions (NAMAs) may absorb some concepts which had originally been discussed in the CDM context, but have been adapted to developments such as the rising importance of climate finance in the UNFCCC process.

Methodology

The analysis is based on an evaluation of recent UNFCCC submissions, a desk review of the relevant literature and databases, as well as a set of semi-structured expert interviews. It starts with an assessment of the debate on sectoral approaches in existing mechanisms, with an initial focus on the CDM, including a review of the historical debate on a sectoral CDM and the recent evolution of PoAs and SBs. Here, despite changing terminology and definitions, the historical debate on a sectoral CDM offers some important early insights into some of the most relevant political, institutional and technical aspects of various sectoral approaches, such as the distinction between project-based and policy-based approaches. This distinction has become more and more explicit, by gradually introducing programmatic activities and standardization of baselines and other methodological elements into the CDM, while other concepts have moved to emerging mechanisms, or are applied on the national level as domestic policy measures. Furthermore, the most recent developments regarding sectoral approaches under the UNFCCC negotiations are reflected. The desk review is complemented by an analysis of a set of indicators regarding the potential of the identified sectoral elements standardized baselines, programme of activities, sectoral crediting and trading, as well as domestic policy instruments for NMM/FVA and NAMAs, by differentiating and structuring the analysis according to various institutional, technical and political aspects. A reflection of relevant barriers for adoption of sectoral approaches, as well as opportunities to overcome them is provided together with a set of recommendations for political decision makers.

Potential sectoral approaches

Summarizing the results, **PoAs** have established themselves firmly within the CDM framework, and are set to achieve significant improvements in line with the political objectives of the CDM regarding sectoral and geographical distribution – as long as political ambition allows for a sufficiently conducive market environment. Some PoAs can be considered to come close to sector-wide upscaling of mitigation actions, provided they will be fully implemented. Overall the concept enjoys a high degree of acceptance, and its value is recognized beyond the CDM.

PoAs are also highly applicable to both NMM and NAMAs. A critical difference to standardization is that PoAs do not require as much engagement by host countries as SB development, but direct most efforts to project proponents, and to some extent to the

UNFCCC. This can be expected to shift considerably for both NMMs and NAMAs which raises fundamental questions about capacity as well as the viability and integrity of some institutional and technical aspects. More positively, the analysis finds evidence for the CDM Policy Dialogue's proposition that the combination of standardized approaches and PoAs can be a powerful combination in terms of simplifying applicability for future mechanisms, including sectoral approaches, or possibly a reformed "CDM+". More fundamental adjustments are necessary to adjust the PoA concept – particularly the CME – CPA relationship for STM and SCM type of NMM approaches, which is likely to require a shift of responsibilities from CMEs to host country government authority, raising a range of challenges from capacity and governance architecture to incentive structure design.

CDM standardization introduces further sector-orientation into the CDM, as **SBs** need to consider data from the entire sector, and will be – possibly mandatorily – applicable to all CDM activities of the same type in the respective country or region. Still, it has also become clear that the standardization process is still in an early stage, and it is to be aware of a potential trade-off between the transaction costs of a market mechanism and its environmental integrity. SBs are also highly applicable for both NMM and NAMA mechanisms. On a most fundamental level, this is because SBs are established based on performance of (sub)sectors, not projects. Sometimes differences between SB applicability for NMM or NAMAs emerge, e.g. with regard to the degree of centralization of regulatory requirements. In other instances, e.g. with regard to the capacity and transaction cost indicators, it is important to differentiate between stakeholder groups, as simplification for market participants may mean higher transaction costs and more complex capacity requirements for host countries and/or UNFCCC bodies. Importantly, the CDM standardization process is still recent, but now fully operational, and can in theory be extended to additional CDM sectors, or transferred to other mechanisms that build more directly on sectoral approaches like the CDM, including those that emerge from outside of the UNFCCC.

Beyond existing mechanisms the report analyzes sectoral approaches under future mechanisms, with a special focus on sectoral elements that have been proposed in the UNFCCC negotiations for the NMM, FVA or NAMAs. Here, more policy-based sectoral approaches that have not been taken up in the CDM are reflected, of which the most relevant approaches are **sectoral crediting and trading** under the NMM. Crediting and trading approaches are mainly thought for applications with broad scopes/segments of an economy, and thus are designed for a sectoral mechanism. The EU proposals for SCM and STM underscore this fact. The requirements for regulatory and administrative actors are significant on the international supervisory level, as well as at the government level. Installations are most likely not influenced, apart from experiencing domestic policies and instruments that were incentivized by the crediting approach – unless governments would directly transfer credit incentives. Sectoral crediting - and trading even more - demand high quality data for projections. As the current reporting provisions under ICA and within the BURs still need to demonstrate their robustness, it appears more likely that crediting and trading would be better suited under a central mechanism with clear rules such as the NMM.

Under future mechanisms and NAMAs, national governments play a more important role than in the CDM as they need to design and provide oversight for **domestic policies and measures** with GHG reduction benefits. Compared to NAMAs, stricter international provisions from a centralized mechanism such as the NMM are likely to increase the environmental integrity (including net emission reductions). However, the NMM (and even more the FVA) do not exist yet. Today, any domestic policy measure can be labelled as NAMA, as long as it complies with the UNFCCC (MRV) provisions, although the lack

of incentives for private sector investment (e.g. through crediting approaches and the insufficient levels of (public) international climate finance) have so far prevented a stronger uptake of NAMAs.

Barriers for implementation

Based on the results of the analytical steps key challenges for implementing and further developing sectoral approaches are identified, as well as potential ways to overcome these obstacles. For each of the different mechanisms we focus on the stakeholder groups “UNFCCC”, “national governments”, and “market actors”. Due to the vagueness of sectoral approaches to date, the opportunities to overcoming barriers are very encompassing and are intended to serve as a basis for discussion rather than drawing up elaborate or fine-grained solutions. Challenges identified for the **UNFCCC level** comprise aspects regarding common rules and standards, issuance of certificates, lack of mitigation mechanism “infrastructure”, lack of demand and market oversight, and “institutional vacuum” for containing certificate price volatility. Challenges identified for **national governments** encompass the governance of national implementation, aspects of incentive setting, as well as structures for certificate issuance. Challenges identified for **market actors** address the incentive structure for participation in activities, the need for investment certainty, the practicability of sectoral approaches as well as capacity constraints at market actors level.

Findings

Overall, the range of sectoral approaches sketched above in the first place seems to qualify for NAMAs, but could also be developed as an RBF scheme (which does not prevent labelling it a NAMA, though). Once the picture on future mechanisms on the international level becomes more diversified, the role of domestic policy measures under the future climate policy regime will become clearer, and should be studied and analysed further. In sum, emerging sectoral mechanisms are likely to be more diverse than the CDM. They could, for instance, cover not only one multilateral market mechanism which would cover theoretically all sectors, but could also include a variety of different “sector-specific mechanisms”, which are designed specifically for (sub)sectors with highly idiosyncratic features.

In order to consolidate the findings, we attempt to contribute to adjusting the terminology that is used for various sectoral approaches in order to capture these important recent developments and the differences between them. At least three ideal types of sectoral approaches have been emerging:

- **Sector-oriented approaches:** take into account entire (sub)sectors, for instance by developing mandatory SBs. These approaches still operate on a crediting basis, which may include projects, programmes, and even policies such as renewable energy feed-in tariffs (REFIT). Yet, due to their voluntary nature, they may not necessarily cover all emitters in a country or sector.
- **Sector-wide approaches:** refer to approaches that scale up mitigation action by covering entire (sub)sectors, e.g. by relying on PoA approaches. Yet, compulsory participation ensures complete coverage within the respective subnational, national or regional contexts. Likely early examples could include an STM or SCM approach that is targeting e.g. emissions-intensive industries.
- **Sector-specific approaches:** refer to mechanisms that are designed specifically for (sub)sector or even a single technology with highly idiosyncratic features, e.g. REDD, HFCs, aviation, shipping), and may operate across multiple countries. “Sector-specific” can imply broader definitions of sectors (energy, forestry), or also

narrower subsectors (HFCs as subsector of industrial gases, coal power as subsector of industrial EE). A potentially high degree of net mitigation could be achieved if these mechanisms – in particular those with very low costs per tCO₂e reduced – can be transitioned away from offsetting.

Looking ahead, a key question is how these sectoral approaches will continue to evolve. SBs and PoAs are likely to continue to be improved and consolidated within the CDM framework, but also to diffuse into NMM, FVA and NAMAs. Which specific aspects of which sectoral approach may evolve in which direction, and how, depends on many factors. These include the paths that the political UNFCCC negotiations may take: the debate on new mechanisms is progressing only very slowly, and concern over the lack of ambition on finance and mitigation, as well as the resulting CER market depression overshadows technical discussions. Other inputs originate from contexts that have traditionally not been at the centre of the debate on sectoral approaches. For instance, the rise of importance of the climate finance issue, in tandem with the market crisis, has led to a stronger focus on the interactions between carbon markets and climate finance, e.g. through RBF. Such approaches are already quite prominent e.g. within REDD and the GCF, but are a rather recent trend in the CDM context. For instance, the UNFCCC's Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP) negotiation stream calls for “unlocking opportunities for raising pre-2020 ambition”, and mentions the option of voluntary CER cancellations for this purpose. A dedicated cancellation account for this purpose has now been set up in the CDM registry. It can be expected that such discussions will rise in importance, as it is clear that sectoral approaches, which are supposed to operate at larger scales than the CDM, need to establish more effective price volatility control mechanisms. It is inconceivable that any government or private sector actor would agree to deep and potentially costly mitigation actions without a sufficient level of certainty on anticipated support with finance, technology and capacity building.

While the paper evaluates recent developments regarding sectoral approaches within the climate regime, it does not fully elaborate on certain aspects, such as in general the added value of new mechanisms compared to a reformed CDM+ with changed modalities and procedures. It also is beyond the scope of this study to provide solutions for solving the deadlock in the climate negotiations on the NMM or showing opportunities for avoiding a strong fragmentation trend away from the NMM towards the FVA. Here, it needs to be further assessed which incentive structures could convince countries and market participants to engage in potentially transformative interventions in key sectors of their economies.

In order to establish the link between the previous analytical exercise above – which sometimes consciously does not factor in political feasibility in order to explore a broader range of possible concepts – and the UNFCCC negotiations the study proposes a set of recommendations for further research and potential input to the UNFCCC debate and negotiations on sectoral approaches.

1 Introduction

Background

In September 2012, the "High-level Panel on the CDM Policy Dialogue" published its final report which recommends that the Clean Development Mechanism (CDM) should be used to support the development of new climate finance instruments that go beyond the existing approach - such as a sectoral CDM (S-CDM), "New Market Mechanism" (NMM), the "Framework for Various Approaches" (FVA), or Nationally Appropriate Mitigation Actions (NAMAs). For years there has been a discussion on how the CDM can evolve from a project-based approach towards a more comprehensive or sectoral scope. Important existing developments in this direction are the CDM Programme of Activities (PoA) and standardized baselines (SB). Regarding emerging market mechanisms, the Conference of the Parties (COP) 17 in 2011 established the NMM and FVA, which may serve as potential vehicles for sectoral approaches in the future. In addition, NAMAs may absorb some concepts which had originally been discussed in the CDM context, but have been adapted to developments such as rise of importance of climate finance in the UNFCCC process. In this context, the question arises how the transition period to a new climate regime can be shaped most effectively. This includes further development of market mechanisms to become more effective climate policy instruments, and the role of sectoral approaches in this process.

Objectives

Hence, the goal of this research project is to analyze and assess the debates and ongoing developments regarding sectoral approaches in existing and emerging UNFCCC mechanisms. This analysis shall serve to better understand to which extent existing mechanisms such as the CDM have already evolved towards a stronger sectoral perspective. Moreover, this research intends to contribute to expand the knowledge base on the foundations on which future mechanisms such as the NMM, FVA, NAMAs, and potentially others can build in their respective future trajectories.

Methodological approach and outline

For this purpose, we reflect on the ongoing United Nations Framework Convention on Climate Change (UNFCCC) negotiations and expert debates. We conduct a document analysis of recent UNFCCC submissions, and a desk review of the relevant literature and a range of databases such as the United Nations Environment Programme (UNEP) Risoe Center CDM, PoA, and NAMA Pipelines. In order to add depth to the analysis, we have also conducted a set of semi-structured expert interviews with interviewees from three stakeholder groups: UNFCCC negotiators, academic/think tank experts, and market participants. In addition, the authors draw on participant observation from negotiations on existing and emerging mechanisms for many years.

The resulting research report proceeds as follows: In a first step, we elaborate a short "inventory" of items and concepts regarding sectoral approaches. We therefore assess the debate on sectoral approaches in existing mechanisms, with an initial focus on the CDM (Chapter 2). Initially the academic debate on sectoral CDM is summarized (2.1), followed by a description of the most important developments referring to sectoral expansion under the CDM. First, we take stock of how the PoA concept has contributed to the methodological toolkit, and whether PoA pipeline allows drawing conclusion whether this approach already shows indications of sector-wide upscaling (2.2). Then, we reflect on progress regarding CDM standardization – again, both with regards to concep-

tual and regulatory developments first, and then by taking stock of the early implementation experience (2.3). In chapter 3, we extend our focus beyond existing mechanisms, and assess sectoral approaches under future mechanisms, with a special focus on sectoral elements that have been proposed in the UNFCCC negotiations for the NMM (3.1), the FVA (3.2) and for NAMAs (3.3). Chapter 4 then consolidates the findings as a preparation for the subsequent assessment. Chapter 5 offers an analysis on how the sectoral approaches from existing CDM elements and the early stages of negotiations on emerging mechanisms may be utilized for the further evolution of sectoral approaches within a reformed CDM and their potential for integration into NMM/FVA and NAMAs. We assess which approaches are more likely to become integrated into any specific or all of the above-mentioned instruments. First, a set of indicators is defined (5.1) which allows differentiating and structuring the analysis according to various institutional, technical and political aspects. Second, we discuss the potential of the identified sectoral elements for NMM/FVA and NAMAs (5.2). Approaches identified for further assessment are:

- ▶ Standardized Baselines
- ▶ Programme of Activities
- ▶ Sectoral crediting and trading
- ▶ Domestic policy instruments

Finally, the report sums up the debate in reader-friendly tables which allow for a quick overview of the key results and messages (5.3).

Chapter 6 builds on the results of these analytical steps and identify key challenges for implementing and further developing sectoral approaches (6.1.). Second, we propose potential ways to overcome these obstacles (6.2). Both sections will discuss sectoral trading and sectoral crediting as key options for the NMM and, where appropriate, FVA, and also consider approaches that may become relevant for NAMAs. For each of these different mechanisms, we focus on three stakeholder groups: the UNFCCC, national host country governments, and market participants / investors. Chapter 7 briefly summarizes key insights from this study, concludes from the previous analysis that at least three ideal types of sectoral approaches have been emerging – sector-oriented approaches, sector-wide approaches and sector-specific approaches –, and offers a set of recommendations.

2 Sectoral elements under the Clean Development Mechanism

The objective of this analysis is to reflect on how the debate around a sectoral CDM has attempted to propose solutions for some of the key criticisms of the CDM at various stages of its evolution. These include, for instance, the objective to trigger transformative shifts via incentivizing policies that can scale up mitigation actions beyond the project level. Other objectives are to enhance sustainable development, strengthen environmental integrity, simplify regulatory processes and standards, as well as the reduction of transaction costs. Over time, some aspects of these proposals have become operational in the CDM, perhaps most effectively through PoAs and SBs. Other issues remain unaddressed and continue to be debated, e.g. geographical distribution, or have shifted along the lines of the broader UNFCCC process, such as the more recent demand for market mechanisms to contribute to net mitigation impacts. The discussion of sectoral mechanisms based on the CDM is structured along three main analytical dimensions, which consider the institutional, technical and political dimensions of these approaches, respectively.

2.1 The historical debate on a Sectoral CDM

In expert circles, the debate over a broadened scope of the CDM started with the rise of the CDM from around the year 2000. The following overview of these discussions on a CDM with a sectoral scope (Sectoral CDM, SCM) starts with a discussion of the various definitions of such a mechanism, and the respective advantages, and challenges with respect to institutional, technical and political aspects which had been discussed.

The definitions of what constitutes a sectoral CDM differ substantially, and have evolved over time, though they were hardly ever presented explicitly. Conceptually, the term sectoral CDM has been applied to both project-based mechanisms and policy-based mechanisms. The former could refer to aggregating multiple projects or allowing up-scaling of project-based activities by facilitating the CDM process through sectoral baselines or positive lists for judging project additionality (Barata & Helme 2008). Policy-based approaches constitute a fundamentally different concept. In order to counter any confusion regarding the terms policy and project in case of a policy-based S-CDM, Figueres (2006) clarified that the policies themselves are understood as the “project” (today the term “mitigation action” may be more appropriate), whereas the actual emission reduction activities implemented by emitters in response to the policies do not constitute “projects” in the sense of credited projects under the CDM. Such a policy based CDM is largely related to the concept of the sectoral crediting mechanism that is promoted by the EU today.

A policy-based sectoral CDM could either be financed by international crediting (e.g. Samaniego and Figueres 2002; Ward et al. 2008), or solely by the host country (Dutschke 2005). In the former case, host countries could receive Certified Emission Reductions (CER) for implementing policies based on previously defined benchmarks (Schmidt 2005). This stream of revenues could then be allocated via a clearinghouse mechanism by the host country government (Figueres 2002). A mechanism without international financing could aim towards international harmonization of policies and measures (Schmidt 2005). Under “graduation and deepening” countries could choose between an ex ante intensity target with emissions trading, or implement a countrywide, “policies and measures CDM” as a no lose target (Bodansky 2004). Ward et al. (2008) on the other hand proposes “Sustainable Development Policies and Measures” (not credited) and for some suitable sectors sectoral no-loose targets (credited). A distinction can also be made between a standards-based versus an incentives-based mechanism (Barata & Helme 2008). This debate has many of the elements of the current discussion on unilateral and

supported NAMAs, as well as the sectoral approaches promoted by the European Union (EU).

2.1.1 Political Dimension

The main aspects of political nature relate to the broader context of the evolving architecture of the climate regime and UNFCCC negotiations, into which the CDM and its reform processes are embedded. Key issues include emissions reductions burden sharing between Annex I and Non-Annex-I (NAI) countries, and – closely related – Parties' acceptance of the mechanism. Other aspects include the mechanism's potential in triggering transformative change, as well as benefits for sustainable development, and their equitable distribution. The potential to reduce transaction costs, the mechanisms' scope, as well as, more recently, the relevance of enhancing certainty on robust market prices.

A S-CDM that designates industrialized countries as leaders of the mitigation effort can be politically advantageous as it increases the appeal of market mechanisms for developing countries, which could also be highly cost-effective (Figueres, 2002). Compatibility with the Kyoto Protocol, a potential for capacity building and contributing to the adaptation fund could further enhance its attractiveness (Figueres 2002). The mechanism could, however, also be perceived to weaken industrialized countries' responsibility in case of a mechanism without international financing or if cost-neutral policies and measures are considered to be part of Non-Annex I Parties' obligation (Dutschke 2005). An overly complex mechanism, which exceeds the capacity of developing country governments, will likely also have less developing country support. High upfront costs in establishing country-wide baselines could reduce attractiveness unless they are funded by industrialized countries. The distribution of burden and benefits likely remains contentious until the COP establishes detailed guidance (Sterk 2008). Issues due to an imbalance of supply and demand of CERs were mentioned by Dutschke (2008); expecting higher reduction commitments by Annex-I countries, a mechanism based on financing by CERs was long seen as advantageous, today this would seem disadvantageous due to plummeting CER prices.

Openness of a mechanism with regards to territorial coverage and the policies that can be used to enable emissions reductions is seen as attractive to potential host countries. The sectoral scope could also be open and either entails an entire sector, a sub-sector, activities across sectors, regional or city-wide actions as well as a combination of all of these (Figueres 2002). A geographically defined S-CDM – e.g. a city-wide policy – could further be limited to specific sub-sectors. Only few discuss a possible limitation in terms of host country eligibility – most seem to presume any Non-Annex I eligible. Bodansky (2004) limits the range of potential host countries for a sectoral mechanism to developing countries that do not have absolute national targets and substantial emissions e.g. in excess of 50 million tons of Carbon Dioxide (CO₂).

The initial discussion on benefits besides mitigation focused on transformative changes and environmental and social benefits (Figueres, 2002). Sustainable development was later addressed more explicitly noting that a sectoral approach might overcome the lack of rules regarding the role of Sustainable Development (SD) criteria in the Designated National Authority (DNA) choice of projects, since the policies implemented would per definition follow the host country's strategic planning, while incentivizing emissions reductions (Figueres 2006). The question of how a mechanism could aim to enable step-changing technologies (Barata & Helme 2008) did not gain much traction in later discussions.

2.1.2 Institutional Dimension

Generally the structure of decisions pertaining to a sectoral mechanism may be comparable to the hierarchy of decision making on the CDM where international treaties such as the Kyoto Protocol are at the highest level, therefore, agreements by the Conference of the Parties (COP), serving as the Meeting of the Parties to the Kyoto Protocol (CMP), set political and strategic direction, and provide authoritative guidance for regulatory bodies like the CDM Executive Board, which define operational rules, standards, and procedures. Advisory bodies to the Executive Board (EB) such as the CDM Methodology Panel shape the establishment of rules even though they do not formally decide on them. Rules decided on different levels have different characteristics and lifetimes (Michaelowa et al. 2007). Annex I countries are responsible for creating demand for credits by mitigation commitments. Prospective host-country governments play a role both as regulators as well as implementers of a sectoral mechanism. As regulators they are to ensure comparability among standards used across market-based mechanisms, ensure proper reporting, monitoring, and verification of emissions reductions and sustainable development caused by implementation of a S-CDM. As implementers host countries are to design appropriate policies including proper allocation of funding. While Figueres (2002) notes that potential difficulties could result in the implementation of policies due to the need for collaboration between ministries, between public and private sector stakeholders and the need to engage with civil society, this may be a country and sector-specific issue.

2.1.3 Technical Dimension

A general difficulty concerns the definition of what a sector is: while products and services serve as a common criterion, others such as the inputs (energy use, fossil fuel use, fertilizer use), the types of GHGs emitted, or industry size could be used and a cut off level within the product-chain between up- and downstream is required for the sector definition. The sector definition needs to take place on the backdrop of substantial political interests and implications on baseline definition. It has been shown that the complexity of establishing the baseline vastly depends on sector definition and also results in varying levels of risk regarding leakage (Figueres 2002; Dutschke 2005; Barata & Helme 2008).

Reducing uncertainty and avoiding the need to establish baselines for each individual project has been noted early on. Michaelowa proposed a combination of national and project-specific baselines (1998), while Sokona et al. (1998) and Begg et al. (2001) have proposed an early version of standardized baselines, which would have been developed by the CDM Executive Board. If chosen well, Dutschke (2005) notes that sectoral baselines and large-scale monitoring and verification of an S-CDM could reduce transaction costs substantially. Refinements, such as dynamic baselines, accounting for unforeseen changes due to e.g. more rapid technology penetration (WBSCD 2008), would however increase efforts. Barata and Helme (2008), however, note that though differentiated benchmarks based on best practices allow tailored solutions, they can be costly and difficult, since they require accurate historic installation emissions data and the capacity to accurately forecast emissions. Monitoring would require coordination across companies within the sector, which may be opposed by the private sector. If the country used penalty funds to buy replacement emissions reductions, it could still reward those who achieve their targets even when others fail. Such an internal "clearinghouse", which would ideally allow indicating the average reduction cost over the whole project had already been discussed early on (Samaniego and Figueres 2002).

Some sectors may be better suited for a S-CDM (e.g. those with only a few large point source emissions and good data availability) and some have even seen initiatives from

emitters themselves in proposing sectoral approaches. A sectoral benchmark proposed for the cement industry (WBCSD 2008) included a benchmark to demonstrate additionality before and during project implementation and one for baseline calculation. The latter proposes a dynamic benchmark that would account for changes of Business As Usual scenario (BAU) trends. Also the iron and steel sector (Duan 2009) as well as the aluminum sector (Siikavirta 2006) have been discussed as a sector suitable for a sectoral mechanism. And additional options may be opened up such as energy efficiency measures – noted as underrepresented under the CDM at that time (Figueres and Philips 2007).

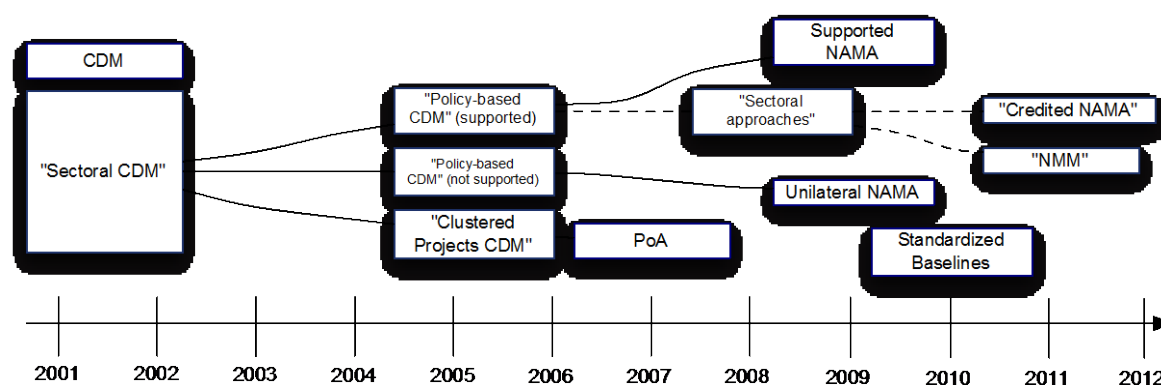
The concept of additionality is vastly different between a policy-based or project-based mechanism: additionality of a policy-based mechanism would not be assessed on the level of individual actions, but rather concern the overall policy design. With a larger scope strong guidance on getting additionality right becomes more important. A new challenge in defining additionality arises in case of measures and policies that are not funded by industrialized countries, since funding must already be available in the host country (Dutschke 2005). Figueres (2006) notes that the issue that the additionality requirement can act as a perverse incentive on policymaking could be eliminated by proper design of baselines. In order to encourage step-changing technologies, the issued CERs could be divided (by the EB or the host-country) to specifically fund such technologies that have a great abatement potential but are not quite yet competitive. Addressing double counting, Barata & Helme (2008) proposes to simply ban countries adopting an S-CDM from conventional CDM activities.

More recent developments include research that has informed the CDM Policy Dialogue, as well as the formal UNFCCC review of the CDM's Modalities and Procedures (M&P), which both consider certain aspects of transforming the CDM, or some of its elements, to a sectoral mechanism. The CDM Policy Dialogue final report observes that the understanding of sectoral mechanisms has “evolved into a slightly more flexible concept that includes not only approaches across a sector but also approaches across a sub-sector, a segment of the economy, or even a group of emitters. In this sense the important characteristic is that mitigation is considered at a broad level of aggregation” (CDM Policy Dialogue 2012, p.27). Furthermore, the report concludes that “there are no inherent barriers to reforming the CDM to pursue sectoral approaches. Indeed, the combination of standardized baselines and programmatic CDM [...] suggests that the apparatus for pursuing such approaches is already operative, if unused. Perhaps the largest barrier faced by such approaches is one of demand,” (p.27). Therefore, the final report remains vague, but draws attention to the significant evolution of the CDM's regulatory framework that has already been achieved. It is worth noting that the panel rightly notes specifically the potential of combining standardization and programmatic approaches, as well as the severe impact of the absence of demand, which affects not only the CDM, but potentially any future mechanism (Michaelowa 2012). By reflecting on the question whether Reducing Emissions from Deforestation and Degradation (REDD+) should be included in the CDM, O'Sullivan et al. (2012) summarize a longer-standing debate, which centres around the issue whether the CDM in its future guise should remain an overarching umbrella mechanism for all sectors, or whether it is more sensible that critical sectors with highly idiosyncratic features should be managed under separate sectoral mechanisms (other examples include HFCs, aviation and shipping).

The CDM 2013/14 review had called for submissions from parties on proposed changes to the CDM's modalities and procedures (UNFCCC 2013a). The CDM Executive Board has also compiled relevant suggestions (CDM Executive Board 2013a), and has prepared resulting recommendations to the Subsidiary Body for Implementation (CDM Executive Board 2013b). There is no specific reference sectoral mechanism. These are more tech-

nical and incremental in nature, and do not contain explicit references to transforming the CDM into a sectoral mechanism. However, the submissions of some parties explore some key issues in more detail, including a possible contribution of standardized baselines to net mitigation activities. These proposals will be referenced in the respective sections below. As a preliminary result, the following illustration provides an overview of the development of the concepts and terminology of sectoral approaches.

Figure 1: Evolution of terms used in the context of sectoral approaches



Source: Own illustration.

*Concepts in quotation marks have not (yet) materialized under the terms used.

2.2 CDM Programme of Activities

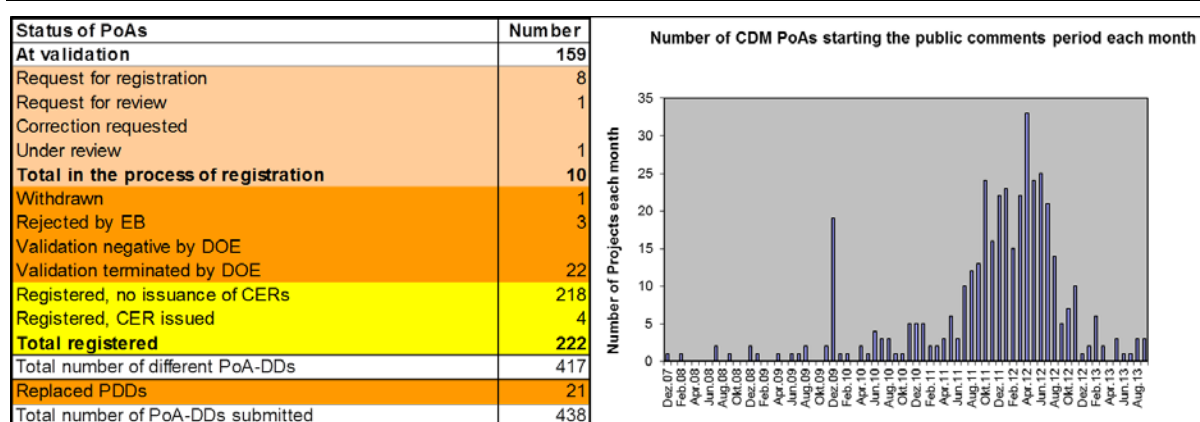
As introduced above, the concept for CDM Programme of Activities has been evolving from the idea to lower transaction costs by aggregating many small mitigation activities (Figueres 2002; Figueres et al 2005). Initially, the concept of “bundling” was created for this purpose (CDM EB 2005), but was soon side-lined by the emergence of PoAs.¹ Already the first CMP guidance relating to the CDM in 2005, shortly after the CDM became formally operational, allowed for the aggregation of an unlimited number of individual activities under a PoA (UNFCCC 2006). Therefore, the operationalization of PoAs can be seen as a significant move beyond the individual project level in CDM’s regulatory framework. Operationalizing these reforms, however, has required several years of ongoing, sometimes cumbersome, regulatory evolution.

Initially, the uptake of the PoA concept had been very slow. At the end of 2008, there were only four PoAs in validation, and the first PoA was not registered until July 2009. This was partly due to the generally higher complexity to develop a PoA compared to a single CDM project, but also because of the need to develop the operational details of the regulatory framework in a learning-by-doing process. A broad range of incremental adjustments to the CDM’s regulatory framework has slowly evolved to make the concept of PoAs operational. The pace of PoA inflow and registration success had increased notably, driven by the requirement that CDM activities from non-LDC host countries needed to be registered before the end of 2012 for being eligible under the EU Emissions Trading Scheme (ETS), but have dropped sharply after that. As of October 2013, there are

¹ The “General principles for bundling” define the approach as “bringing together of several small-scale CDM project activities, to form a single CDM project activity or portfolio without the loss of distinctive characteristics of each project activity. Project activities within a bundle can be arranged in one or more sub-bundles, with each project activities retaining its distinctive characteristics” (CDM Executive Board 2005:1).

now registered 222 PoAs, although only four of these have actually received issued CERs (see Figure 2).

Figure 2: Status and evolution of PoA Pipeline



Source: UNEP Risoe Center 2013

As a first result, it is evident that PoAs have clearly moved from a conceptual to an operational phase, which allows drawing on an increasing pool of practical experience and related data. Yet, the EU ETS deadline, as well as the lack of CER demand from the EU ETS and other potential destinations, has dramatically stopped the inflow of new PoAs.

PoAs remain a rather new instrument, and their effectiveness can only be tentatively assessed at this stage. The following sections will provide a review of the first experiences with PoAs in order to assess whether PoAs already represent a move towards sectoral approaches, or may provide conceptual elements which could be further elaborated in this direction. The first subsection will first elaborate on some distinct conceptual differences between PoAs and the project-based CDM, and discuss their applicability and relevance for sectoral approaches. Then, we turn to the portfolio of PoAs that are in the CDM pipeline, and assess whether certain technologies and/or methodologies can already be interpreted to have achieved a (sub)sector-wide impact? Finally, we summarize some key outstanding barriers for making the PoA concept work on sectoral level.

The PoA concept is closely built on the project-based CDM, and operates within the existing modalities, procedures, and governance structures and the main actors largely fulfil very similar roles. Still, some noteworthy differences with relevance for sectoral approaches exist, which will be structured along the analytical perspectives that have been introduced above.²

2.2.1 Political Dimension

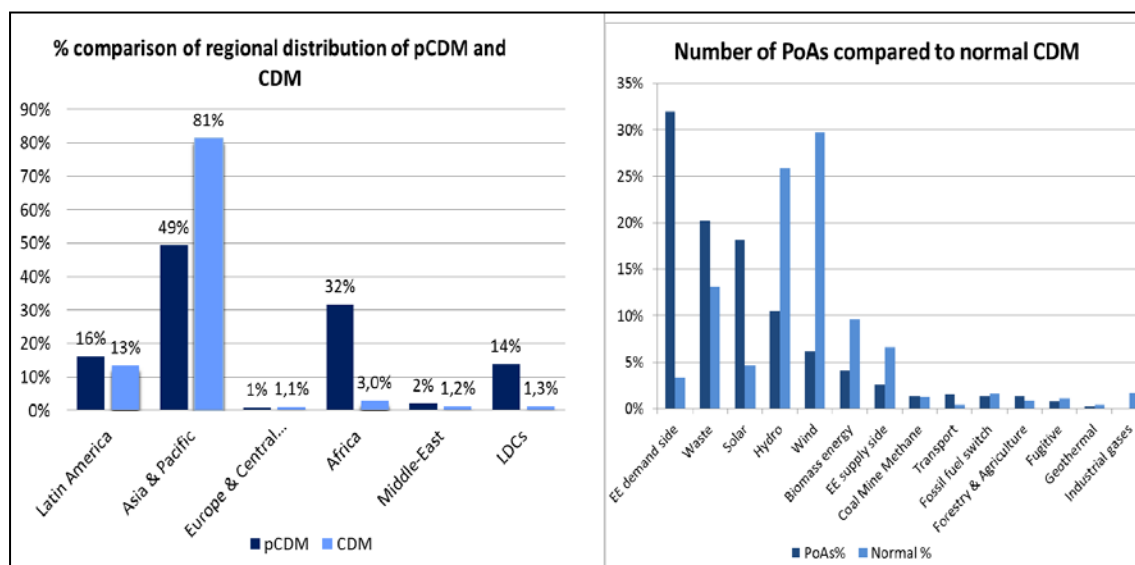
The objectives of introducing PoAs can be seen as an early major response to address key criticisms of the CDM relating to scale up emission reduction activities by reducing transaction costs, while promoting a more equitable geographical distribution of the benefits of the CDM. The PoA concept has originated from the interaction of an expert

² There are currently five sets of modalities and procedures for the CDM (large-scale, small-scale (SSC), afforestation/reforestation (A/R), SSC A/R, carbon capture and storage (CCS)), although a review process of these is currently ongoing as part of the broader 2013/2014 review of the Kyoto Protocol.

debate – which has been sketched above – and the political guidance which had been provided by the multilateral governance arrangements of the CDM.

As Figure 3 reveals, the sectoral and regional distribution of PoAs versus ‘conventional’ CDM activities shows some clear differences which seem to be aligned with some of the political objectives of the UNFCCC.

Figure 3: Regional and sectoral distribution of CDM PoAs and project activities



Source: UNEP Risø Centre 2013b

With regard to regional distribution, some of the so-called “under-represented” countries, notably African countries and Least Developed Countries (LDCs), appear to have much more success with attracting PoAs than with the conventional CDM project activities. In addition, it can be considered a highly significant development that operational procedures are in place which allows for PoA implementation across countries, and even continents. In that sense, the approach is even further than most notions of sectoral approaches, which are generally focused on designing mechanisms within a single country.

With regard to scope, energy efficiency, waste management and solar energy activities – (sub)sectors and technologies with associated high sustainable development benefits – are being taken up much more strongly than under the current CDM. It is a vital aspect of the legitimacy of the PoA concept that the PoA portfolio has already produced discernible differences to the single project CDM, which clearly indicates that regulatory reforms and capacity building can have an actual impact on implementation. Still, PoAs have so far not managed to penetrate a number of sectors such as forestry, agriculture and transportation, which have traditionally been underrepresented in the CDM. These sectors continue to be held back by methodological problems regarding e.g. the permanence of resulting emission reductions, baselines and leakage. These aspects, however, require more far-reaching political decisions rather than incremental adjustments to the existing regulatory framework. Should these be achieved, the PoA concept could easily be transferred, as is demonstrated by a few pilot reforestation PoAs, and a larger number in the voluntary carbon market. Possibly Reducing Emissions from Avoided Deforestation and Forest Degradation (REDD) may emerge as a separate sectoral mechanism, and may potentially integrate some of the afforestation and reforestation (A/R) project types that are currently featured under the CDM (CDM Policy Dialogue 2012).

Regarding potential net mitigation impacts of PoAs, just like for single CDM project activities, all resulting CERs can potentially be used as offsets, and could also be used as “receipts” in a results-based payments framework that would retire the CERs (Raab 2012). There is a voluntary cancellation account in the CDM registry which would allow for tracking such initiatives. In addition, crediting periods that are shorter than technology lifetimes or highly conservative baselines may also contribute to ‘hidden’ net mitigation.

Regarding potential double-counting of emission reduction resulting from PoAs, all CERs are tracked in the UNFCCC-operated CDM registry. Although there is broad agreement that double-counting should be avoided, there is not yet a finalized set of multilateral rules on how to separate the accounting for mitigation actions by developing countries from those that can be potentially used as offset credits. A future sectoral mechanism should integrate its Measurement, Reporting and Verification (MRV) provisions into the emerging global reporting framework, as the demands on developing countries to contribute to mitigation efforts can be expected to increase in the post-Kyoto architecture of the climate regime. This is partially covered under the biennial update reporting (BURs) that Non-Annex 1 countries need to submit from 2014 onwards, but will certainly need to be specified further for any future mechanism.

The political uncertainty around how this pre- and post-2020 climate architecture will look like is closely related to the current lack of clarity on the level of mitigation ambition, which also translates to demand for CERs, and potentially of credits from future sectoral mechanisms. However, the other side of the coin of this lack of demand is an oversupply of carbon credits even from the existing flexible mechanisms. The dramatically decreasing inflow of PoAs is a direct consequence of this highly depressed carbon market situation (see figure 2). Even before, upfront financing for PoAs has been even more difficult to secure than under the conventional CDM, as PoA design is more complex, and, depending on type and location, the associated risks are therefore greater. There are a number of public sector initiatives which target explicitly PoAs in order to help the concept get off the ground, e.g. the KfW PoA Support Programme and the World Bank Carbon Initiative for Development (Ci-DEV). These initiatives may contribute to lending a lifeline to PoAs in priority sectors which may otherwise become unviable in the current market conditions. Yet, it is clear that no market mechanism will be able to function properly in the absence of sufficient levels of demand. In addition, the price volatility for CERs is a strong deterrent for potential host countries: if a country considers participating in a new sectoral mechanism which would demand more far-reaching mitigation actions, and related large-scale investment, it would be necessary to enhance certainty on the value of the resulting carbon credits or other forms of financial support. The higher the related efforts and investments, the higher is the need for a minimum level certainty of return on these investments.

2.2.2 Institutional Dimension

On the global level, the CMP fulfils exactly the same role as for the conventional CDM, by providing political direction and authoritative guidance for the CDM, including for PoA related aspects. Yet, there are no specific CDM modalities and procedures for PoAs. Regulatory oversight, including technical standards, procedures and guidance are provided by the EB and its support structure (working groups and secretariat). Therefore, PoAs operate fully within the Kyoto Protocol framework. As NMM and/or FVA are expected to operate under the Convention rather than the Kyoto Protocol, a political decision would need to establish whether PoAs and the related regulatory framework could

function under another mechanism. However, this decision is relevant beyond PoAs, and is likely to be taken for the entire CDM rather than for PoAs only.

On a national (host country) level, DNAs issue letters of approval for planned PoAs, but are not required to get involved any further than with single CDM projects. Therefore, it is not necessary for the host country to build a higher level of capacity to make PoAs function in practice. However, PoAs can cover multiple countries, and each Component Project of Activities (CPA) in an additional country requires a Letter of Approval (LoA) by the respective DNA.

By contrast, project participants have to be able to cope with the higher complexity of managing a PoA compared to a single project activity. The structure of a PoA is comprised of a responsible Coordinating/Managing Entity (CME), and one or multiple CPAs, which can be located in the same or in multiple countries. Depending on PoA type, scale and location, this can lead to significant management and administration efforts, in particular if CPAs are implemented by different organizations. In this case, CPAs need to agree on contractual arrangements with the CME, e.g. through emission reductions purchase agreements (ERPA), as CERs are always issued by the EB directly to CMEs.

Third-party auditing is required from UNFCCC-accredited Designated Operational Entities (DOEs). By validating and verifying PoAs their role is very similar to the conventional CDM. However, there are some important technical differences. If a DOE is found to be responsible for erroneous inclusion of a CPA into a PoA, the DOE is liable for replacing the CERs of this CPA, which represents a significant economic risk. This has caused a high degree of scrutiny and risk mitigation on the side of DOEs, with trade-offs bringing down transaction costs (see below).

2.2.3 Technical Dimension

PoAs rely on the established CDM project cycle although the operational details of making PoAs work have required some adjustments to regulatory standards and procedures. These have been evolving in a learning-by-doing approach which has sometimes led to high levels of complexity and left room for interpretation, which increases uncertainty.

With regard to methodologies, most approved CDM methodologies can be applied to both PoAs and single project activities, although some restrictions apply. The CDM methodology panel has initiated a process to assess the most relevant methodologies (CDM Methodology Panel 2012). Some of the most frequently used large-scale methodologies are applicable under PoAs (e.g. ACM0002 for grid-connected renewable electricity generation), while others are not (e.g. AM0031 for Bus Rapid Transit Projects). The regulatory assessment, of which methodologies are suitable or eligible to be used for scaling up mitigation activities, can be seen as a first step towards a more “sectoral” evolution of PoAs.

Methodologies can also be combined, as specified by the relevant guidance. The EB at its 65th meeting has merged a set of PoA related standards into single standard for additionality demonstration, eligibility criteria, and application of multiple methodologies (CDM Executive Board 2012). The CME has to develop a PoA Design Document (PoA-DD), which clarifies whether the different CPAs are of the same type or not with regard to demonstration of additionality, emission reduction calculations and monitoring. The provisions are quite narrow, for instance, in the case of ACM0002, CPAs are considered of different types if they rely on different renewable power generation technologies (e.g. solar, hydro, wind, geothermal). As documentation needs to be replicated for different

CPA types, this can lead to very lengthy documentation requirements, which undermine the objective to reduce transaction costs.

Specific approaches on how to establish baselines are unaffected by whether an activity is set up as a PoA or as a single CDM project. Although some problems with establishing baselines persist, e.g. related to lack of (access to) historical data for some technologies or geographic locations, these are the same as for the project-based CDM. The standardization reform process discussed below is much more relevant for streamlining baseline development than PoAs, which have other merits.

Yet, the methodological tools for MRV and additionality demonstration are significantly different compared to single CDM activities. With regard to additionality, the same tools apply than for CDM project activities, and the key question is which criteria need to be met for CPA inclusion.

Making PoAs work has produced important improvements in MRV procedures, e.g. with regard to sampling data. In addition, CPAs for registered PoAs can bypass validation requirements, and lower transaction costs. However, a remaining barrier is that verification can only take place for the entire PoA, including all CPAs, at the same time (synchronized verification). A practical example can help to illustrate the impact of this seemingly simple issue: For compact fluorescent lamp (CFL) PoAs developed according to AMS-II.J (demand-side activities for efficient lighting technologies), emission reductions are monitored based on independent monitoring surveys that have to be conducted within a specified period after the start of distributing CFLs within each CPA activity. The survey defines the emission reduction volume for a set number of years (monitoring period). The surveys would only make sense once the CFLs are distributed. However, a CPA may be included already without all CFLs distributed. In practice it is therefore very difficult to carry out such monitoring surveys at exactly the same point in time for an annual PoA verification (including all CPAs) (Blodgett 2013).

2.2.4 Analysis of CDM PoA Pipeline for move towards sectoral focus

After having analysed the distinct conceptual aspects of PoAs, this section aims to screen the existing PoA portfolio in order to assess whether the application of PoAs in practice allows for additional conclusions on shifts towards sectoral approaches as defined above. On the most fundamental level, the idea that is underlying the PoA concept is to aggregate many activities in order to move beyond the project level. Therefore, one way of answering this question is to look at whether there are actually PoAs in the pipeline that have managed to register more than one of individual CPAs. Another rather obvious aspect to consider is the mere (anticipated) scale of the emission reductions of PoAs. Table 1 illustrates that 29 PoAs in 18 different countries have managed to register at least two CPAs. Nine PoAs have even managed to register more than ten CPAs, and each of these PoAs expects several million CERs, three of them even more than ten million CERs by 2020. The Chinese Sichuan Rural Poor-Household Biogas Development Programme (53 CPAs) is the first PoA that formally relies on a positive list for additionality demonstration - another innovative methodological element in the CDM - that is discussed in the context of sectoral mechanisms (see chapter 3 below). Host countries range from LDCs to BRIC (Brasilia, Russia, India, China) countries. Interestingly, all but one PoAs rely on small-scale methodologies, still, almost all of them expect to reduce at least several hundred thousand tonnes of CO₂ or more until 2020. As mentioned above, the current PoA portfolio is dominated by energy efficiency, waste and electricity generation activities. This means that there is a slight shift in the sectors that have

dominated the portfolio of the project-based CDM, including a notable absence of the most intensely criticized project types (industrial gas, coal power generation, some large scale wind and hydro). Of course it depends on a broad range of factors, including many non-CDM related factors such as local investment climate and governance conditions whether these targets will actually be reached. Another noteworthy observation is that there are a number of public sector organizations listed as coordinating entities. Examples from Table 1 include PoAs such as the Uganda Municipal Waste Compost Programme (National Environment Management Authority), the Egypt Vehicle Scraping and Recycling Programme (Ministry of Finance), or the Solar Water Heater Programme in Tunisia (Agence and Nationale pour la Maitrise de l'Energie).

Table 1: PoAs with more than one CPA

ID	Title	Host country (other)	Coordinating Entity	Status	PoA-Type / Sector	Methodology	PoA lifetime start	2012 ktCO ₂	2020 ktCO ₂	Number of CPAs
PoA 0002	Methane capture and combustion from Animal Waste Management System (AWMS) of the 3S Program farms of the Sadia Institute	Brazil	Sadia	Registered	Methane avoidance	AMS - III.D.	29-Okt-09	2.365,116	10.616,011	1050
PoA 0059	Sichuan Rural Poor-Household Biogas Development Programme	China	Chengdu Oasis Science and Technology Co	Registered	Methane avoidance	AMS - III.R. +AMS-I.C.	10-Dez-10	1,000	5.197,230	53
PoA 0012	CFL lighting scheme – “Bachat Lamp Yojana”	India	Bureau of Energy Efficiency	Registered	EE households	AMS -II.J.	30-Mai-10	1.946,370	7.131,390	50
PoA 0184	PoA for the Reduction of emission	Madagascar (25 others)	Green Development	Registered	EE household	AMS -I.E.	01-Okt-12	0,000	18.527,981	41

	from non-renewable fuel from cooking at household level		t AS		ds					
PoA 0013	Promotion of Biomass Based Heat Generation Systems in India	India	Therma x Sustainable Energy Solutions	Re-gistered	Biomass energy	AMS -I.C.	01-Dez-10	147,544	4.629,400	31
PoA 0004	CUIDEMOS Mexico (Campana De Uso Inteligente De Energia Mexico) – Smart Use of Energy Mexico	Mexico	Cool nrg Carbon Investments	Re-gistered	EE hous ehols	AMS -II.C.	01-Jun-09	74,872	6.070,750	25
PoA 0001	Installation of Solar Home Systems in Bangladesh	Bang-ladesh	Infrast-structure Deve-lopment Com-pany Limited	Re-gistered	So-lar	AMS -I.A.	22-Jun-07	12,142	4.149,184	13
PoA 0055	Than Thien Small Hydro-power Programme of Activities Managed by INTRACO	Viet-nam	Invest-ment and Trade Consul-tancy Com-pany (INTRA-CO)	Re-gistered	Hyd-ro	AMS -I.D.	01-Jul-12	1,693	1.304,750	13
PoA 0170	Green Power for South Africa	South Africa	The Stan-dard Bank of South	Re-gistered	Hyb-rid rene wabl es	ACM 2	18-Nov-11	0,000	10.936,710	10

			Africa							
PoA 000 5	Uganda Municipal Waste Compost Programme	Uganda	National Environmental Management Authority (NEMA)	Registered	Land fill gas	AMS-III.F.	12-Apr-10	136,847	837,010	9
PoA 000 8	Solar Water Heater Programme in Tunisia	Tunisia	Agence Nationale pour la Maîtrise de l'Energie (ANME)	Registered	Solar	AMS-I.C.	23-Jan-07	15,719	417,630	8
PoA 004 5	SASSA Low Pressure Solar Water Heater Programme	South Africa	Solar Academy of Sub Saharan Africa	Registered	Solar	AMS-I.C.	29-Jan-11	166,262	3.258,350	7
PoA 007 1	First Solar PoA in India by SENES Consultants	India	SENES Consultants	Registered	Solar	AMS-I.D.	04-Feb-11	16,000	735,706	6
PoA 012 4	National Solar Power Development Programme, India	India	Emergent Ventures	Registered	Solar	AMS-I.D.	21-Okt-10	3,113	380,771	6
PoA 006 4	Malaysia Biogas Projects	Malaysia	GenPower Carbon Solutions	Registered	Methane avoidance	AMS-III.H.	23-Nov-11	75,968	2.532,330	6

PoA 038 4	Standard Bank Low Pressure Solar water heater Programme for South Africa	South Africa	Standard Bank	Registered	Solar	AMS -I.C.	01-Apr-11	200,000	1.141,370	6
PoA 005 3	The programme to promote efficient lightings in local areas	South Korea	KEMCO	Registered	EE service	AMS -II.C.	27-Okt-09	0,028	6,370	6
PoA 006 3	Improved Cooking Stoves for Nigeria Programme of Activities	Nigeria	Developmental Association for Renewable Energies	Registered	EE households	AMS -II.G.	29-Mrz-11	11,181	990,740	5
PoA 001 8	SGCC In-advance Distribution Transformer Replacement CDM Programme	China	State Grid Corporation of China	Registered	Energy distribution	AMS -II.A.	01-Jan-11	62,699	993,980	4
PoA 000 7	Masca Small Hydro Programme	Honduras	Hidromasca	Registered	Hydro	AMS -I.D.	01-Sep-11	5,845	283,201	4
PoA 002 9	Punjab State Electricity Board: High Voltage Distribution System for Agricultural Consumers in the Rural Areas of the Punjab	India	Punjab State Electricity Board (PSEB)	Registered	Energy distribution	AMS -II.A.	25-Okt-07	1,413	1.245,990	4

PoA 0016	Egypt Vehicle Scrapping and Recycling Program	Egypt	Ministry of Finance	Registered	Transport	AMS - III.C.	11-Mai-11	0,030	212,460	3
PoA 0256	South Africa Renewable Energy Programme (SA-REP)	South Africa	Standard Bank	Registered	Hybrid renewables	AMS - I.D.	27-Feb-12	0,000	448,133	3
PoA 0070	Efficient Cook Stove Programme: Kenya	Kenya	co2balance UK	Registered	EE households	AMS - II.G.	21-Mrz-12	42,132	824,130	2
PoA 0028	Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under Land Bank of the Philippines Carbon Finance Support Facility	Philippines	Land Bank of the Philippines (LBP)	Registered	Methane avoidance	AMS - III.D.	01-Jun-12	40,370	707,343	2

Source: own illustration based on UNEP Risoe 2013b

This is relevant, as sectoral approaches are expected to require a much more comprehensive role of national governments. However, the CDM is indifferent whether the coordinating entity is from the private or public sector. Some PoAs also demonstrate how private sector companies can be incentivized to engage in very comprehensive approaches. Beyond the financial input of private sector investment, the diversity of possible mitigation actions makes it attractive that non-state actors can initiate and implement large-scale mitigation activities. Although the public sector retains regulatory oversight through LoAs and sector-specific regulation, the CDM requires less administrative and technical capacity in a broad range of sectors. However, this capacity may need to be developed when setting up sectoral mechanism which requires stronger host country engagement. This is likely to be feasible only for the most advanced developing countries with sufficient capacity and resources.

2.3 CDM Standardized Baselines

CDM standardization seeks to streamline and simplify some key elements of CDM methodologies most prominently baselines, additionality demonstration and MRV. As the discussion of the historical debate around a sectoral CDM has shown, the standardization of CDM methodologies had been discussed from the outset, although this idea has gained traction only in recent years. Therefore, an assessment of its first results cannot be exhaustive, but provide first indications for its relevance for sectoral mechanisms.

The calculation of BAU scenarios for the emissions intensity and reductions for a broad range of technologies in very different contexts has always raised concerns about complexity and uncertainty, and standardizing and streamlining CDM methodologies had been discussed as possible solutions from the beginning of the CDM (Jackson et al. 2001; Sokona et al. 1998; Michaelowa 1998). Yet, for a variety of reasons, including a general lack of experience with operationalizing baseline- and crediting mechanisms, the concept has only begun to gain more political relevance in the last few years, and is just beginning to be implemented. There are now three approved CDM standardized baselines, as well as a broad range of methodologies which apply standardized approaches to various degrees.

Standardized approaches do not primarily aim at scaling up CDM activities, but rather at simplifying and streamlining them. Easier applicability, however, can of course be seen as a precondition for achieving scale. Key objectives can be summed up as equity, efficiency, effectiveness: Equity by broadening access to the CDM for under-represented countries, for instance by developing easily applicable methodologies “top-down” (see below), and allowing countries to propose e.g. baselines and additionality provisions that are nationally applicable, and do not need to be calculated on a project-by-project level. Efficiency because these steps potentially achieve significant transaction cost reductions for project developers. Initially, however, the host country DNA and/or the UNFCCC will need to make up-front efforts to enable these efficiency gains. Effectiveness, because high-quality standardized baselines may not only enable scaled up mitigation through easier applicability, but also strengthen the conservativeness of baselines and the integrity of additionality tests. However, putting these ideas in practice needs to be done carefully in order to avoid e.g. easily applicable “unambitious” baselines with weak environmental integrity. The following sections will look at these aspects in more depth; however, it is clear that standardization contributes to shifting CDM practices further away from the project-by-project approach.

2.3.1 Political Dimensions

The CMP provided the Executive Board with a strong mandate to roll out comprehensive standardization of methodological elements of the CDM. CMP6 defines a standardized baseline “as a baseline established for a Party or a group of Parties to facilitate the calculation of emission reduction and removals and/or the determination of additionality for clean development mechanism project activities, while providing assistance for assuring environmental integrity” (UNFCCC 2010), and defined a number of key aspects, which include the number of priority sectors (energy in isolated areas, transport and agriculture). CMP7 largely reaffirmed this mandate, although some rifts over the mandatory applicability of standardized baselines emerged during CMP8 in Warsaw 2013. The key question is whether the use of SBs should be mandatory or voluntary once approved, which may create winners and losers (Spalding-Fecher and Michaelowa 2013). Some developing countries took issue with a perceived intrusion into their national so-

vereignty by such a move. However, as standardized baselines always have to be initiated and submitted by host country institutions (DNAs);

this conflict seems resolvable once a better familiarity with SBs will evolve over time. Another important aspect is that a standardized baseline is available to all potential projects developed in a CDM host country and is therefore a public good. This creates a problem in the incentive structure to develop SBs, as private sector actors may not want to allow competitors to benefit from their work in developing an SB. This suggests a strong role of the public sector in ensuring that a broad range of SBs across sectors and regions will be available in the future.

Standardization features have played a prominent role in the submissions on NMM/FVA, as well as inputs to revisions of CDM Modalities and Procedures. While SB development currently to a large extent focuses on LDCs and underrepresented countries in the CDM context, the NMM discussion tends to focus on larger and more emissions-intense middle-income and emerging economies. The procedures are fully applicable to other contexts even though they may be insufficient for NMMs as they still operate within the framework of the CDM's modalities and procedures. In this context one can observe a certain disconnect between the debates on the role of standardization in CDM and future mechanisms. Yet, in particular in light of the lack of progress on NMMs in recent negotiations and the slow, but continuous reform of the CDM, e.g. with regard to standardization and the possible revisions of the CDM's modalities and procedures, it is important to ensure transferring the lessons from existing mechanisms such as the CDM to emerging future instruments.

2.3.2 Institutional Dimensions

CDM standardization still operates within the Kyoto Protocol governance architectures, and is directly mandated by the CMP, the highest multilateral decision-making body on a global level. This reform process can therefore be seen as another regulatory response, similarly to the introduction of PoAs, to some of the most persistent criticisms of the CDM regarding methodological complexity, lack of data availability, and unequal geographical distribution of CDM benefits. It can be seen as a merit of the multilateral architecture of the CDM that standardization aims at addressing concerns that challenge the legitimacy of the CDM.

A critical difference to both the project-based CDM and PoAs is the different role of host country. At least for the development of country- and sector-specific SBs, DNAs are for the first time required to transcend their supervisory role, and assume responsible for the practical development of SBs in their country. This is a highly significant development, which offers opportunities, but also raises challenges. Although the first steps towards implementation have only just begun in a few developing countries, mainly in Africa, this move can be expected to generate valuable lessons for new sectoral mechanisms, which are also anticipated to demand a greater role from host country governments.

In addition, the Executive Board as well as the UNFCCC Secretariat also assumes important functions in the direct development of standardized methodologies as mandated by the CMP. However, this is not an entirely new role, as small-scale methodologies had previously been developed or commissioned by these actors. It is worth noting that the CDM EB, in contrast to most international regulatory bodies, has access to a comparatively large pool of resources that are independent from donor governments, which is an important factor in the agency. These funds have already been used, among others, to

initiate a loan scheme to cover the costs of CDM documentation in under-represented countries, and to establish regional CDM collaboration centres (RCC) in Africa and Latin America. A key role of these RCCs, among others, will be to provide support for developing standardized baselines. In addition, the World Bank and bilateral donors are beginning to dedicate resources for developing standardized baselines and methodologies for priority project or PoA types.

2.3.3 Technical Dimensions

The CDM EB work programme for CDM standardization focuses on sector-specific standardized baselines, but also includes other methodological elements such as additionality testing, MRV (e.g. sampling), and full-fledged top-down development of new CDM methodologies for prioritized project types with high sustainable development impacts and relevance for under-represented countries.

A standardized baseline allows to reduce transaction costs for project developers significantly, as a key part of the required work for project documentation – calculating the baseline – is readily available once it is approved by the CDM EB, and does not need to be conducted again and again for each individual projects. In addition, the common use of default factors may alleviate the problem of data availability for project types that operate in informal sectors and/or rural contexts in low-income countries, e.g. for efficient charcoal production.

Due to these simplifications, it is important to safeguard the environmental integrity of CDM baseline as all resulting CERs can be used to offset emissions elsewhere. Environmental integrity can be positive in case of “ambitious baselines”, which may even result in potential net mitigation impacts. A key problem for accounting for such net mitigation is that there are no accounting procedures to make the net impacts of highly ambitious baselines visible. This does not allow the host country to claim such mitigation effects. The CDM does currently not formally require net mitigation through ambitious baselines; however, baselines always have to be developed according to the principle of conservativeness, as well as according to a set of quality criteria such as accuracy, completeness, recentness, among others, which are specified in the relevant procedures. This means that baselines should be developed based on the most accurate and recent data (CDM EB 75, Annex 33). However, if a baseline inflates actual emissions due to faulty or incomplete data this results in over-allocation of CERs for mitigation activities.

As mentioned before, DNAs are responsible for overseeing the integrity of SBs. For this purpose, DNAs need to develop and implement systems for quality assurance and quality control (QA/QC). Data ownership and management as required by the QA/QC-System are the most demanding aspects of the new roles of a DNA in the SB procedures. There is very little experience with these systems yet, although different scenarios are possible. DNAs may own the data itself and maintain it in a specific archive or registry. By contrast, there could be a model in which the DNA merely coordinates the relevant sectoral agencies which take over some responsibility for managing the data quality of the SB. These responsibilities are very significant, as they represent a shift in the established role in the DNA, which is related to what can be expected under sectoral mechanisms. These systems are just beginning to be tested in practice and the capacity of DNAs especially in lower-income countries represents a potential challenge in ensuring the integrity of SBs. The procedure also allows for developing multi-country standardized baselines. In such cases, one DNA shall act as the lead and other DNAs from participat-

ing countries shall endorse the submission of the application for adoption of a standardized baseline.

SBs are valid only for a period of normally up to three years, and need to be updated after that, again based on the respective CDM EB procedure. Importantly, however, SBs can be revised top-down if the EB feels that technological innovation of faulty applications have resulted in SBs with low integrity. Third-party auditors (DOEs) are also involved in ensuring the integrity of a SB by compiling an assessment report (AR) on the quality of the DNA's QA/QC system, which can be compared to a validation. For the first three SBs in "under-represented countries, the AR can be omitted, however, the UNFCCC itself will then perform checks similarly to the AR by the DOE".

SBs need to be based on approved methodologies or tools, and in line with respective procedures. If a new methodological approach is employed, the SB needs to follow the established procedures for developing new methodologies or tools. Therefore, the existing institutional checks and balances in the CDM also apply to SBs. These are complemented by an expanding set of procedures and guidance, which have been more complex than originally expected, and the way forward for SBs has been critically assessed by senior international experts (Schneider et al. 2012), and even the CDM Methodology Panel (UNFCCC 2012c). Still, the regulatory framework needs to be considered as being at an early stage of maturation with first steps towards consolidation only beginning. As with the operationalization of previous reforms, some "teething" problems can be expected which can be addressed in the CDM's tested learning-by-doing approach.

Additionality can also be standardized through the SB procedures, for instance by defining positive lists for certain technologies, or other eligibility criteria. Some technologies are now automatically additional on a global level, but these must be considered as exceptions with comparably high costs (solar, off-shore wind, marine renewable energy), or only at micro- or pico-scale. This concept is at an early stage, although it has already been employed in some PoAs (see Table 2), and is discussed prominently both in the CDM reform debate, and in the discussions on new mechanisms, including on bilateral mechanisms such as the Japanese Joint Crediting Mechanism.

2.3.4 Portfolio analysis of standardized approaches under the CDM

As explained in the section on technical dimensions, standardized baselines are most frequently mentioned although the standardization agenda is more encompassing. An important distinction is between a standardized baseline, and a standardized methodology, in which a broader set of technical elements is standardized. In addition, the most recent procedure formally distinguishes between top-down and bottom-up standardization (UNFCCC 2013a). First, examples for standardized methodologies and their relevance for sectoral approaches will be introduced, followed by an assessment of currently available portfolio of bottom-up sector-specific SBs.

Top-down standardization

This aspect of standardization concerns mainly streamlining of existing methodologies, as well as development of new methodologies for desired sectors and contexts. As per the mandate of the CDM these efforts have mainly focused on small-scale interventions that are applicable to LDCs. A key advantage is that they are globally applicable, which is more efficient in terms of transaction costs. However, a challenge is that sometimes default values are overly conservative (although there are also examples of loose provi-

sions that result in weak integrity). Table 2 uses rural electrification as an example of a sector in which most methodological progress has been made.

Table 2: Selected standardized CDM methodologies for rural electrification

CDM Methodology	Degree of standardisation	Eligibility conditions	Country-specific standardisation potential	Number of Projects / PoAs
AMS-I.L. Electrification of rural communities using renewable energy	Default baseline emission factors of 6,8 – 1,3 – 1,0 tCO ₂ e/MWh for different categories of end-users (e.g. households) for off grid or mini-grid	75% of end-users shall be households End-users are not electrified, supplied with efficient lighting, Equipment meets quality standards	Default factors considering suppressed demand Country-specific end-user weighting	0/1
AMS-III.BB Electrification of communities through grid extension or construction of new mini-grids	Baseline emissions are the sum of emissions associated with new and existing consumers. Same default values as in AMS-I.L.	Limited to communities with no access to a national or regional grid At least 75% of the end-users (by number) shall be households.	Default factors considering suppressed demand Project emissions and leakage	0/1
AMS-III.AR Substituting fossil fuel based lighting with LED/CFL lighting systems	Default values for baselines emissions (lamp emission factor, fuel use rate, utilization rate, annual utilization, fuel emissions factor), resulting in emission reductions per lamp of 0,092tCO ₂ /lamp). Crediting period dependent on performance standards	Lamp life must be certified by manufacturer (5,000/10,000h), which affects crediting period (2 or 7 years) Max. 5 lamps per household	Higher level of suppressed demand, minimum service level, fuel emissions factor.	1/13
AM0103 Renewable energy power generation in isolated grids	Emission factor of the isolated grid (t CO ₂ /MWh), based on the composition of the isolated grid, if data are available	Use of one of the following sources: hydro, wind, geothermal, solar, wave or tidal power. Specific conditions for hydro power apply.	Limited	0/0

Source: own illustration

In part this standardization has happened because there is a lot of experience and data in the energy sector, but also because such project types with high sustainable development impacts which are applicable especially in LDCs fit well with the political priorities of the standardization reform programme. It can clearly be seen in Table 2 that the methodologies that are applicable to rural electrification in a narrower sense have not been implemented at scale yet. Still, they are a particularly noteworthy element of the CDM toolkit, as there has been a lot of recent progress on a methodological level, e.g. by introducing default values that eliminate the critical barrier of lack of data availability. In addition, the concept of suppressed demand is gradually being introduced, with quantified estimates of minimum service levels, e.g. for household electricity consumption, which are then translated into baseline default values. Concepts such as suppressed demand are often absent from the discussion on sectoral mechanisms, which tend to focus on more advanced developing countries. Yet, even in China and India, there are still vast regions and populations to whom these concepts are relevant. The review of the historical debate and the political drivers for introducing both PoAs and SBs indicate that such demands will be raised also for new mechanisms. The increasingly comprehensive operationalization of these concepts e.g. in SBs is therefore potentially relevant both for the CDM as well as for new market mechanisms. Beyond rural electrification, top-down development of new methodologies and standardization of existing ones is a key aspect of the EB work programme in the coming years.

Bottom up standardized baselines

Standardization allows countries to develop sector-specific standardized baselines, which aim at taking into account specific country circumstances. Due to the prominent political mandate for standardization, a relatively elaborate regulatory framework has been emerging over the last two years, to operationalize the bottom-up development of country-specific, consistings mainly of the following documents, as well as a number of related forms and standards:

Table 3: Procedures and Guidance for sector-specific standardized baselines

SB-specific CDM EB procedures and guidance documents	<ul style="list-style-type: none"> ► Procedure: Development, revision, clarification and update of standardized baselines. Version 03.0 (EB 75, Annex 33)* ► Guidelines for Quality Assurance and Quality Control of Data used in the Establishment of Standardized Baselines. Version 01.0. (EB 66, Annex 49) ► Guidelines for the Establishment of Sector Specific Standardized Baselines. Version 02.0. (EB 65, Annex 23) ► Establishment of standardized baselines for afforestation and reforestation project activities under the CDM Version 01.0 (EB 70, Annex 10)
Further relevant CDM EB procedures and guidance which contribute to standardization	<ul style="list-style-type: none"> ► Guidelines for determining baselines for measures. Version 1.0 (EB 69, Annex 21) ► Guidelines on the demonstration of additionality of small-scale project activities. Version 09.0. (EB 68, Annex 27) ► Guidelines on the consideration of suppressed demand in CDM Methodologies. Version 02.0. (EB 68, Annex 2)

- Development, revision and clarification of baseline and monitoring methodologies and methodological tools (EB 70, Annex 36)

Source: Own illustration, based on CDM website

However, the applicability of these procedures has only been tested scarcely, as there are not too many practical examples so far. Table 4 lists all approved and proposed SBs that are available have been approved by or proposed to the CDM EB.

Table 4: Approved and proposed sector-specific standardized baselines

Reference	Sector	Title	Submitted by (applicable countries)	Submitted	Approval Date/Status
Approved Standardized Baselines					
ASB-0001	Power Sector	Grid emission factor for the Southern African Power pool	Botswana (Democratic Republic of the Congo (DRC); Lesotho; Mozambique; Namibia; South Africa; Swaziland; Zambia; Zimbabwe)	21 Aug 2012	31 May 2013
ASB-0002	Charcoal production for consumption in households and SMEs	Fuel switch, technology switch and methane destruction in the charcoal sector of Uganda	Uganda	16 May 2012	31 May 2013
ASB-0003	Power Sector	Grid emission factor for the Republic of Uzbekistan	Uzbekistan	31 Jan 2013	7 Oct 2013
Proposed Standardized Baselines					
PSB-0002	Cement	Standardized baselines for clinker production in Ethiopia	Ethiopia	24 Jul 2012	Initial assessment
PSB-0004	Rice mill sector	Standardized baseline of energy use in rice mill sector of Cambodia	Cambodia	27 Sep 2012	Initial assessment successfully concluded
PSB-0006	Power Sector	Grid emission factor of Belize	Belize	23 May 2013	Initial assessment successfully concluded

Source: Own illustration, based on CDM website

It is clear that the SB portfolio has mainly focused on sectors which have already been taken up quite comprehensively under the CDM, such as energy and cement. Other sectors with less CDM experience have not yet begun to develop SBs. Therefore, at least in the initial phase, SBs can be seen as a consolidation of existing experience. Other sectors such as transport, agriculture or forestry have not yet been taken up, although specific guidelines for such SBs are anticipated or already under development. The first sector-specific guidance has been published for SBs for afforestation and reforestation (CDM EB 70, Annex 10).

In terms of geographical scope, it is clear that SBs are mainly developed in so-called under-represented countries such as LDCs, which is in line with the political guidance by the CMP. To which extent the concept can be integrated into NMMs, where the discussion focuses on higher-income countries, still needs to be seen in practice, although the available guidelines are fully applicable to all sectors in all potential host countries. Some of these sectors with relevance for the economies of more advanced developing countries have been explored on a conceptual basis (see chapter 2.1).

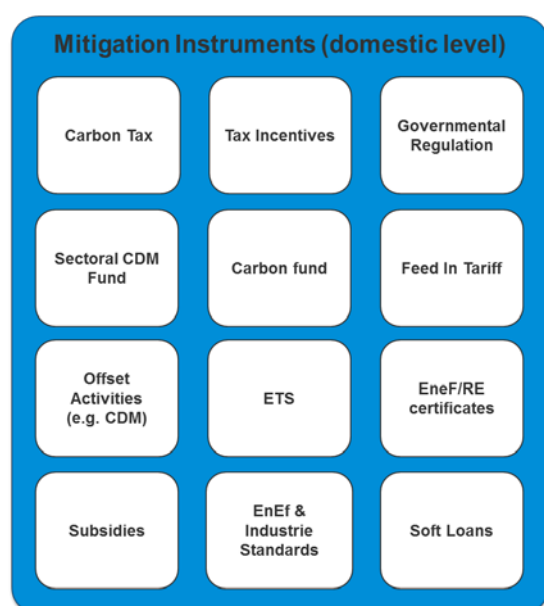
3 Sectoral options in emerging UNFCCC market mechanisms

As outlined above, the debate on sectoral approaches has been evolving for more than a decade, and has produced a broad range of ideas and concepts. The initially rather technical debate by academic experts was taken up by policy- and decision makers in the „golden days” of the carbon market back in 2007 and 2008. Back then, the CDM reform process took up concepts of PoAs and later laid the foundations for standardization of baselines and other methodological tools. In UNFCCC negotiations on the post-2012 treaty following the Kyoto Protocol, Parties started debating concepts of sectoral approaches in line with the mandate coming from the Bali Action Plan in 2007. The two main concepts discussed as sectoral approaches for a post-2012 climate policy world, are “sectoral trading” and “sectoral crediting”, which were promoted by the EU from 2008 onwards in the negotiation stream on “Long term Cooperative Action” (LCA). Some of the market friendly Parties supported the EU’s sectoral approach, others opposed it – but only few other Parties introduced their own concepts. Koakutsu & Usui (2013) offer a good overview of country submissions on the NMM and FVA until mid-2013. In the following we assess the distinct negotiation streams with relevance for sectoral approaches under an emerging and future climate policy regime, namely the New Market Mechanism (NMM), the Framework for Various Approaches (FVA) as well as NAMAs. For the latter we also regard the debate on non-market based approaches (NMAs).

A very important aspect in the discussion of future market mechanisms is the distinction between project level mitigation and government level mitigation results. Navigating through the landscape of existing and future mechanisms is complex, given that individual mechanisms address different actors and levels, operating in very different country- and sector-specific circumstances. Under the CDM, incentives for action were initially addressing directly the emitters' level, while the NMM envisages incentivizing governments to take action on a scale beyond the project level.³ In case of the NMM, but also under NAMAs governments can choose whatever policy instruments they deem adequate on the domestic level to incentivize mitigation action. An illustrative list of such instruments is provided in figure 4 below, while figure 5 illustrates the layers of decision making under the CDM and NMM.

³ CDM PoAs or standardized baselines allow for focusing on mitigation opportunities beyond individual projects.

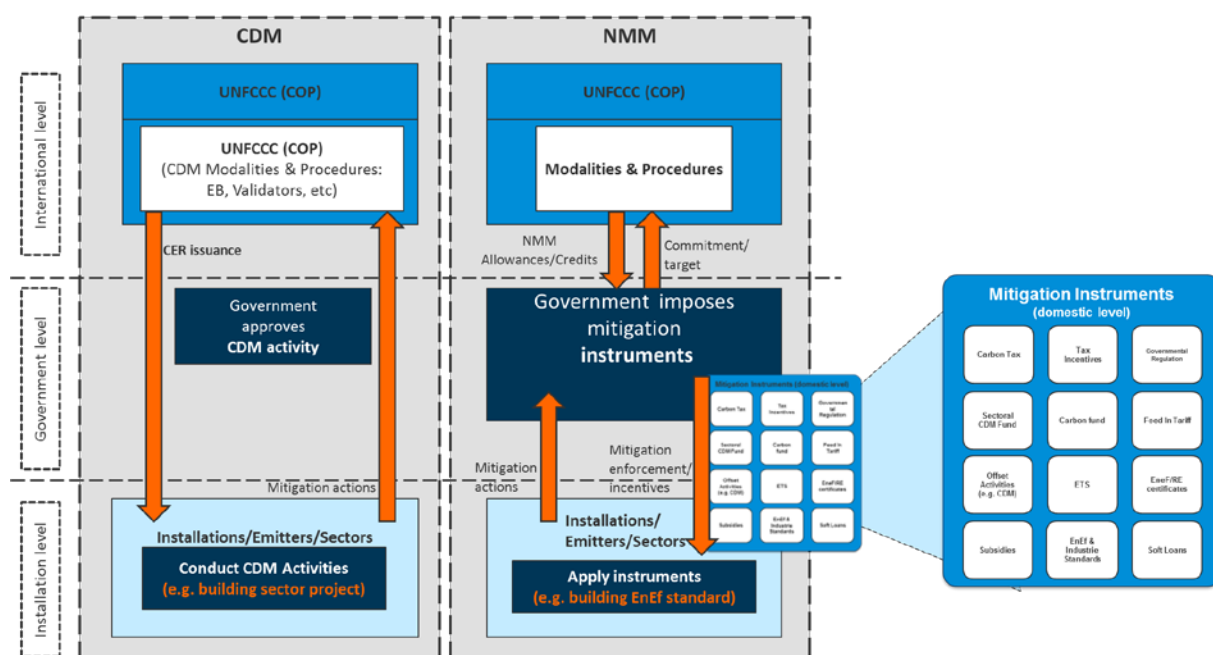
Figure 4: Policy instruments under emerging market mechanisms



Source: Perspectives GmbH

It is important to note that the different structure of the interaction and the relationship between domestic governments and implementing actors raises new governance challenges: There is an incentive structure at play that could lead both NMM host country governments and implementers to inflate baselines, set unambitious caps or harm environmental integrity in other ways. It is not quite clear yet, how an independent regulatory body (such as the CDM Executive Board) could counteract such incentives and supervise the integrity of such mechanisms on an international level. As the debate on emerging mechanisms is still recent, and lacks conceptual clarity and experience from practical implementation, we direct our focus in the subsequent sections more strongly on the political dimensions, and only discuss institutional and technical details to the extent possible.

Figure 5: Different levels of decision making for mechanisms and instruments



Source: Perspectives GmbH

3.1 Elements of sectoral approaches in the negotiations of the NMM

Following the mandate from the Bali COP in 2007, negotiations came in 2011 to a definition on the NMM as follows: “new market-based mechanism (NMM), operating under the guidance and authority of the COP, to enhance the cost-effectiveness of, and to promote, mitigation actions, bearing in mind different circumstances of developed and developing countries [...] which may assist developed countries to meet part of their mitigation targets or commitments under the Convention” (UNFCCC 2011). COP 18 in 2012 further clarified that the NMM should “deliver real, permanent, additional, and verified mitigation outcomes, avoid double counting of effort and achieve a net decrease and/or avoidance of greenhouse gas emissions” (UNFCCC 2012), and should include both project-based as well as sectoral approaches. In this respect, the NMM is expected to cover **“broad segments of the economy”**, though there is still no agreed upon definition what this phrase exactly means.

3.1.1 Political Dimension

Current options for NMM design comprise variations of crediting and trading approaches (including the EU proposal for a sectoral mechanism). However, further details, the scope and structure of the NMM are still unclear, and as the 2013 COP in Warsaw did not deliver a detailed set of modalities and procedures for the NMM, it is only expected to be further defined towards the end of 2014 at COP 20 in Peru – or possibly even later. A key lesson from the evolution of the CDM described in previous sections is that the operationalization of reform concepts has always taken several years.

A Joint Workshop of UNFCCC Parties on the New Market Mechanism and FVA held in October 2013 in Bonn, Germany gave a good overview on the status of the negotiations on new market mechanisms. Its session on New Market Mechanism (NMM) addressed the progress in the work programme on the elaboration of modalities and procedures for a NMM and the subsequent submission to COP19 for consideration by the Parties. The

UNFCCC Secretariat provided a synthesis paper featuring the outcomes from the workshops in 2012 as well as the submissions received by Parties in 2012 and 2013, and identifying areas of convergence as well as items for further discussion (UNFCCC 2013a). The paper also highlights open questions that were identified at SBSTA 38 in June 2013, serving as the basis for the discussion of the 2013 workshop. With regards to sectoral approaches, SBSTA 38 raised notably the following questions regarding “broad segments of the economy” to be answered by the parties:

- ▶ How should the NMM stimulate mitigation within such broad segments of the economy?
- ▶ What are examples of such segments?
- ▶ On what basis should the participating Parties define broad segments of the economy?

Based on the dialogue in 2012 and 2013, as well as on the submissions of parties the UNFCCC Secretariat (2013a) summarized the debate on sectoral approaches (i.e. “broad segments of the economy”) as follows. For actually achieving “sectoral coverage” (first question) one could either

- ▶ limit the scope of the NMM to sectoral and national crediting and trading schemes, thus excluding project-based activities; or
- ▶ broaden the scope of the NMM to cover a range of approaches, in order to increase the scale of mitigation.

If Parties choose to broaden the scope of the NMM, it could potentially comprise different tracks for crediting (second question), such as

- ▶ credited NAMAs,
- ▶ sector-based approaches,
- ▶ policy- or programme-based approaches,
- ▶ net avoidance approaches,
- ▶ REDD+, or
- ▶ project based approaches and micro-scale activities.

These could be either credited or traded within a centralized, decentralized or hybrid system. For this purpose a general framework could be developed to choose which sectors qualify under which track. The definition of “broad segments of the economy” could either be a prerogative of the host country or be agreed internationally. In case an international definition is envisaged by the Parties, the following three options could be considered (third question):

- ▶ Option 1: a broad segment of the economy constitutes a significant proportion of a country’s emissions (e.g. the energy sector) and/or a significant proportion of a country’s gross domestic product;
- ▶ Option 2: a broad segment of the economy means one or more sectors, categories or subcategories listed in annex II of the UNFCCC guidelines on reporting and review, as adopted by the Conference of the Parties in decision 15/CP.17;
- ▶ Option 3: a broad segment of the economy covers one or more of the sectors identified by the Intergovernmental Panel on Climate Change (IPCC) as relevant to mitigation.

3.1.2 Technical & Institutional Dimension

Although it is currently only vaguely defined, the NMM terminology already suggests a certain degree of conceptual proximity to the CDM as expressed by the terms "real", "permanent", "additional", "verified", etc. to describe the nature of envisaged emissions reductions. Nevertheless some crucial differences are discernible. Calls for submissions through Parties have over the past years received a broad range of responses, but have enabled some progress on mutual understanding of the various proposals as a basis for agreement on the future role of market mechanisms. Recent submissions and discussions show that most Parties agree on a NMM design that addresses mitigation activities beyond the project level (see Annex 2 for an overview of submissions with reference to sectoral approaches). The most relevant suggestions for sectoral mechanisms as per the above list are:

- ▶ The EU advocating for a sectoral crediting and sectoral trading mechanism:
 - ▶ While still dependent on the legal nature of target setting, a Sectoral Trading Mechanism (STM) implies that sanctions would apply to a host country in case of non-compliance with the underlying commitment. In a top-down regulatory situation, an amount of allowances corresponding to the sector's target would be allocated to the country ex-ante. Given the binding nature of such a mechanism, the government would pass the reduction responsibility on to the emitters in the respective sector, either by setting up an ETS or by imposing mandatory mitigation policies and measures. Any shortfall of allowances would have to be filled by acquiring allowances from abroad; consequently any surplus of allowances could be sold.
 - ▶ By contrast to a mandatory STM, a Sectoral Crediting Mechanism (SCM) would be based on a voluntary or "no-lose" target. The target is also set below a business-as-usual scenario but has no binding character – the host country government thus does not face sanctions if the target is not reached. In the case emissions are reduced below the target, the difference between the emission level and the target will be credited ex-post. Credits could be sold on the international carbon market and hence provide international finance for mitigation. In a situation where domestic and international finance can be blended, the host country could initially contribute to mitigation through domestic measures below the business-as-usual scenario but above the non-binding target. This could allow reaping the so-called "low hanging fruits" with the lowest abatement costs, whereas for activities that address reductions beyond the non-binding target (so-called "higher hanging fruits") international finance should be accessible. However, the incentive for emitters to meet or even over-achieve the non-binding target is clearly weaker than under a trading mechanism with mandatory reduction obligations.
- ▶ Colombia proposed in 2011 a "Mechanism for Carbon-Efficient Economies (MCEE)", which is essentially a discounting approach with a sectoral and sub-sectoral scope. Discount factors could range from 2 – 41%, depending on the countries' share of global emissions. Further a 2 per cent share of proceeds for the Adaptation Fund was proposed. The MCEE would complement domestic mitigation of developed countries, and co-exist with the CDM – CERs would have to be subtracted from MCEE reductions (UNFCCC 2011).
- ▶ Brazil is suggesting a sectoral mechanism based on voluntary cancellations of CERs. Given that the CDM EB has been accepting voluntary cancellations by credit owners since 2012, they may also transfer them to third parties. Third parties could be Par-

ties, non-state actors, companies or even individuals. Sectors such as air transport or maritime transport could benefit from these cancellations of CERs in order to reduce carbon footprints without creating new mechanisms. Such cancellations would provide the CDM with impetus to continue for the years to come, positively impact the carbon price, and would even allow for the creation of new market mechanisms. A clearer focus on cancellations – an aspect of the CDM, that is readily available for everyone – would allow existing projects to move forward and capitalize on the fact that the CDM is still generating a lot of credits. Sectors that are interested could resort to CDM cancellation to lower their carbon footprint (UNFCCC, 2013b). In Brazil this mechanism has already been put to use in making the Rio 20+ conference carbon neutral. Similar actions are planned for the World Cup as well as the Olympic Games in 2016. However, Brazil's proposal did not find approval at COP 194.

- Ecuador has proposed a “Net Avoidance Emission Mechanism” which would essentially allow claiming credits for not exploiting fossil fuel resources. A practical example was the Yasuni National Park Initiative, which however was scrapped in late 2013 by presidential decree.

One interviewee elaborated on the scope the NMM could cover:

“I am rather skeptical this [NMM] will move forward, because the contents of climate policy move away from international offsetting to national climate policy, so maybe a mechanism such as the NMM is not so much more required, and may die in the negotiations. If it continues, and has added value, it should reach areas that the CDM cannot reach, including sectoral and policy crediting, these would be the most interesting areas for NMM” (Interview No.6).

3.2 Elements of sectoral approaches in the negotiations of the FVA

In addition to a top-down design for an NMM, many countries are envisaging to individually develop market-based mechanisms for mitigating GHG emissions. These activities include regional ETS (EU ETS, North American schemes), domestic emissions trading schemes (which are being developed in numerous countries supported by the World Bank's Partnership for Market Readiness (PMR), bilateral offsetting schemes (Japan), domestic offsetting schemes (e.g. China, Australia, California, Canadian provinces). In the future, subject to political agreement, potentially credited elements of Nationally Appropriate Mitigation Actions (NAMA) could also be envisaged under the FVA⁵. In addition, some countries are proposing non-market based activities (see also 3.3).

3.2.1 Political Dimension

In order to recognize these “fragmented” attempts under the UNFCCC, in 2011, COP 17 decided to establish the “Framework for Various Approaches” (FVA). COP18 in Doha decided to “consider” whether the FVA is to be developed under UNFCCC authority and guidance. The underlying idea is to prevent a complete fragmentation of market mechanisms by providing authoritative guiding principles and criteria, and oversight at least at the highest level. The objective is to establish at least a minimum level of transparency, environmental integrity, and comparability of efforts. Other bilateral arrangements or domestic efforts may become relevant for the FVA in the future: The agreement between California and Latin American countries on the eligibility of Reducing

⁴ See

http://unfccc.int/files/documentation/submissions_from_parties/adp/application/pdf/adp_brazil_workstream_2_cdm_voluntary_cancellation_20130918.pdf

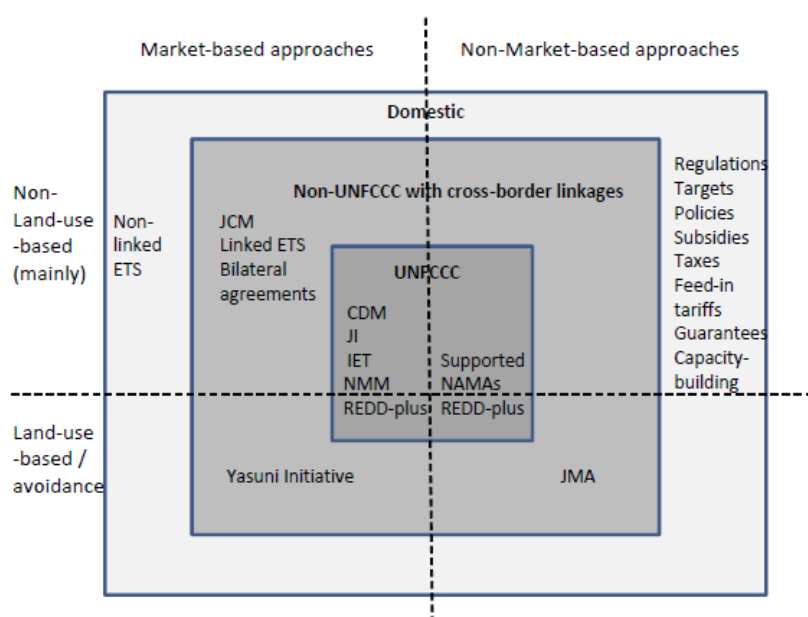
⁵ Note that credited NAMAs are still at an extremely early stage in negotiations – mentioned occasionally under NMM and FVA discussions, but at the same time do not comprise an official element under UNFCCC negotiations.

Emissions from Deforestation and Degradation (REDD) credits is one, which even foresees the use of offsets from international sectoral crediting mechanisms in the future. Carbon taxes coupled with domestic offsets – as is the case in the Canadian provinces of British Columbia and Alberta are another. The Australian Carbon Pricing Mechanism represents a third example – which is, however, set to be dismantled after a change of government.

The negotiations on the FVA are informed by a number of submissions, and Parties did debate the FVA at the UNFCCC Joint Workshop in October 2013 (UNFCCC 2013a). The discussion addressed progress with regard to the COP 18 mandate to conduct a work programme for elaborating a FVA and submitting it to COP 19 for consideration by the Parties. For this purpose, the UNFCCC Secretariat produced a synthesis paper on outcomes from the workshops in 2012 as well as the submissions received by Parties in 2012 and 2013 (UNFCCC 2013c). While there is no specific focus on “sectoral nature” of mechanisms / approaches under the FVA so far, examples for initiatives under the FVA comprise (see also figure 6 below):

- ▶ The flexible Kyoto mechanisms, namely the CDM, JI and IET;
- ▶ The New Market Mechanism;
- ▶ Regional and domestic or subnational trading schemes, such as the EU ETS, the Australian ETS and emerging Chinese municipal and provincial pilot trading schemes;
- ▶ Bilateral offset schemes, such as the Joint Crediting Mechanism (JCM) operated by Japan;
- ▶ NAMAs proposed by developing countries;
- ▶ The Joint Mitigation and Adaptation Mechanism (JAM) for integral and sustainable management of forests developed by the Plurinational State of Bolivia;
- ▶ A mechanism for avoidance of emissions, such as the Yasuni initiative developed by Ecuador.

Figure 6: Illustrative scope of approaches under the FVA



Source: UNFCCC (2013c)

The submissions on the FVA contain only very limited information on technical details regarding sectoral scope of the framework, and mainly state that the framework should be open to sectoral approaches. See Annex 2 for an overview.

3.2.2 Institutional & Technical Dimension

There is still little understanding regarding the governance of the FVA, and how the UNFCCC can ensure that mechanisms of different designs can be integrated into the global climate governance architecture. Key questions include whether such mechanisms will be governed under the direct “authority” of the COP, or merely under a looser interpretation of “guidance”, e.g. through principles that may be agreed upon within the UNFCCC, while implementation, including regulatory powers, remains outside of the UNFCCC.

“Parties will claim freedom to develop their own trading and crediting regime – and here the FVA comes in. This means a variety of different trading and crediting schemes growing in parallel will face the problem of different standards for compliance in an international regime, and mutual acceptability. Here the FVA was coming in, but now after Warsaw we have a situation where many negotiators lost faith in the purpose of having a coherent framework prior to 2020, and thus I doubt that we will have a coherent system prior 2020. The intention of the FVA was to address those initiatives such as the JCM and make sure that they comply with a set of defined criteria, and hopefully create a process to enforce those criteria. Hence, the FVA is a safety valve for ensuring that at least some degree of integrity is left. But the negotiations on the FVA have pretty much collapsed in Warsaw, and nobody seemed to be very surprised, and that speaks volumes about the expectations on markets in the run up to 2020.” (Interview No.3)

Party positions on the FVA differ considerably, with the EU and various developing nations requesting a stronger centralized governance of the UNFCCC, while e.g. Japan, the USA and New Zealand favour a minimum set of common standards that allow for comparing various evolving bottom up activities.

“While markets are down any positive proposal and signal that a country is active is a good signal. Here Japan plays a very constructive role, also in the light of the changes of the Japanese energy policy and the problems in meeting their pledge. I think this whole discussion on the JCM is an asset for the discussions on the FVA level. Trying to simplify and standardize is good as well.” (Interview No.9)

3.2.3 Elements of sectoral approaches in the negotiations of Non-Market based Approaches (NMA) and Nationally Appropriate Mitigation Actions (NAMAs)

An agenda item of the negotiations with relevance for sectoral approaches are non-market based approaches (NMAs). While there was no big interest in discussing NMAs, reiterative calls of socialist Latin American parties to include NMAs have led to this agenda item. The relevance of non-market based approaches depends on whether a broad range of domestic mitigation action measures with no direct market-character (i.e. no tradable units) will be attributed towards the NMM, the FVA or NAMAs – or shall be accommodated under a distinct vehicle (which e.g. Bolivia desires). Such domestic measures could comprise a vast list of measures, such as standards (performance, fleet, buildings), labelling schemes, grants and subsidies, taxes, feed in tariffs (FiTs) or other regulations (Phillips 2013). In its submission to SBSTA 39 on NMAs the Environmental Integrity Group (EIG 2013) showcases 5 measures that appear suitable for NMAs, namely

- ▶ Progressive phasing out of subsidies for fossil fuels,
- ▶ Phasing down of the production and the consumption of hydrofluorocarbons (HFC),
- ▶ Promoting renewable energies,
- ▶ Ecolabels,
- ▶ REDD and forest bonds.

The EIG concludes that no distinct discussion on NMAs under SBSTA is required, as NMAs are already covered by many negotiation streams inside and outside the UNFCCC. On similar lines the EU recognizes the relevance of NMAs for mitigation, but

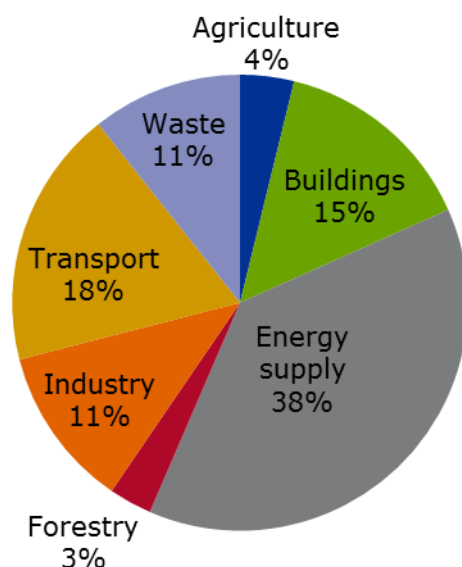
sees no need for further establishing a separate mechanism for NMAs (European Union 2013). Overall, the discussion on NMAs is juvenile (and will probably remain), and seems not to lead to the establishment of a non-market based mechanism. It is nevertheless helpful to at least regard the debate on NMAs in the light of sectoral approaches, as many NMAs have a transformative or sectoral character. However, the NMA debate must also be read in the light of the current intermediate and very dynamic character of the negotiations that still leave a lack of clarity regarding which approaches and measures can be attributed to which mechanism— e.g. under NAMAs or under the UNFCCC finance debate, or more general as results based finance (RBF).

A **Nationally Appropriate Mitigation Action (NAMA)** addresses voluntary activities of GHG emissions mitigation in developing countries that are not subject to UNFCCC mitigation commitments and can be supported by developed countries through financing, technology transfer or capacity building. Actions taken are to result in measurable reportable and verifiable emissions reductions below emissions under business as usual i.e. in the absence of those actions. Potential measures can range from strategic policies supported by legislation (e.g. a renewable energy target with a feed-in tariff), sector-wide mitigation policies over programmes of mitigation activities to specific individual projects (so NAMAs are not a mechanism amongst parties at governmental level, but address individual domestic emitters, see introduction to chapter 3 above). Due to this flexibility, many believe that NAMAs are suited to also address dispersed and non-stationary GHG emission sources, such as agriculture and transport. In any case, NAMAs are thought to comprise mitigation actions way beyond the standalone-project level and thus they may be able to leverage the kind of transformational changes hoped for in the discussion of sectoral approaches (Lütken et al., 2013). The NAMAs put forward so far cover a wide spectrum of emission sources, often within a boundary colloquially referred to as a sector, which is also reflected in the NAMA database (2013). The UNFCCC NAMA registry⁶ might in the future provide similar insights, but has not been filled with substantial content yet, due to its very recent operationalization.

⁶ See <http://www4.unfccc.int/sites/nama>

Figure 7: Sectoral distribution of NAMA concepts globally

Sectoral Distribution



Source: NAMA Database (2013)

While the political framework for NAMAs is still under development it becomes increasingly clear that NAMAs will become a core element of the future international climate policy regime. While the development of NAMA concepts frequently depends on support by international entities, the Cancun Agreements (UNFCCC 2010) differentiate two types: NAMAs designed for implementation solely through domestic funding (“unilateral NAMAs”) and those designed for additional international support for implementation (“supported NAMAs”). Domestically funded and internationally funded elements are in practice often combined within a single framework. Many NAMA proposals include distinct elements that can be financed and implemented relatively independently to account for the preferences of prospective donors. Most NAMA concepts identify support needs that are not necessarily limited to financial support, but encompass also technology transfer or capacity building measures. Such support can often be obtained more readily through bilateral or multilateral donors or facilities officially approved by the Conference of the Parties, such as the Green Climate Fund (GCF) or the Global Environmental Facility (GEF).

A far-reaching concept that has so far not operationalized could play a more relevant role at a later stage by NAMA finance approaches with elements of carbon market vehicles: A “credited NAMA” mechanism could be envisaged under which supported NAMAs could choose to seek co-financing for certain elements via the generation and sale of emission credits for emission reductions achieved (Okubo et al. 2011). A more immediate version of credited NAMAs could also refer to a “framework approach” in which a CDM PoA is blended with additional upfront finance and other forms of technical support, e.g. with regard to setting technical appliance standards.

An additional source of finance could be provided by the private sector, as is often highlighted by Annex-I countries. Experience on how to leverage private sector finance for NAMA implementation is insufficient to date, however and a lot more foundational work needs to be done (Michaelowa 2012). The most promising avenues seem to be RBF approaches, which essentially retire CERs, and thus effectively pilot a transition of the

CDM from an offset to a performance-based payments scheme. Further varieties with upfront finance components are conceptually possible. Main reasons for the limited traction of NAMA crediting until today include uncertainty on methodological issues, and the attributability of emission impacts to some policy instruments. In order to ensure environmental credibility, the additionality of policies needs to be assessed meaning that mitigation costs of the policies need to be positive. NAMAs should therefore be differentiated according to their marginal abatement cost, such that those actions with negative marginal abatement costs should not be creditable (Michaelowa 2013). NAMA crediting has also been criticized on baseline issues – policy crediting is “unlikely to be feasible due to the difficulties of setting boundaries and baselines” (Röser and de Wit 2012, p.5). However, the use of approved baseline and monitoring methodologies allow generating additional emission reductions with a reasonable degree of MRV-ability, and should thus be expected to enjoy a high degree of legitimacy among Parties. In particular if structured as an RBF scheme that retires credits and thus uses them as “receipts” rather than offsets (Raab 2012), such an approach could gain broader acceptance as a credited NAMA in the future.

Given their still widely open scope, NAMAs have so far drawn heavily on building blocks from established mechanisms in order to design actions that credibly cause measurable, reportable and verifiable emissions reductions. NAMAs have drawn on approved CDM methodologies for baseline and emission reductions estimates as well as MRV design. Given the currently low CER prices, it may also become attractive to transform existing CDM or PoA activities into a supported NAMA based on RBF as described above. Technology goals or standards are another element of the discussion on a sectoral CDM that has been applied in NAMAs. Klein et al. (2009) discuss technology-based sectoral NAMAs for energy-intensive sectors such as cement, iron and steel. Such NAMAs would be based on technology choices which would allow for simple MRV systems. They note the appeal of conditional NAMAs for developing countries – NAMAs, which would only be implemented in case that international financing materializes. While NAMAs have taken up many aspects of the various sectoral approaches discussed in the academic literature, a sectoral crediting mechanism might still have advantages over supported NAMAs if it would result in a common carbon price for all types of emissions reductions within a sector (Helme et al 2010). In order to avoid conflicts between several credited NAMAs that overlap in a particular sector one could in such cases switch to sectoral crediting and not allow for other credits within that same sector.

At COP 19 Parties decided that the teams reviewing Biennial Update Reports (BUR) of developing countries, should comprise of a majority of experts coming from non-Annex I Parties. MRV of unilateral NAMAs will not be subject to any international scrutiny. CDC Climat (2013) expects that in the long run, MRV of supported NAMAs could look like the MRV of REDD+ agreed in Warsaw, however, the language is currently very soft, and does not seem to guarantee a sufficient level of transparency, comparability and rigour yet. Importantly, the BUR process for non-Annex I parties requires parties to report from the end of 2014 onwards, and start building up national emission inventories. The requirement is that the second BUR (due end 2016) shall cover data back until 2012, which means that data availability can be estimated to improve over the next years. However, it remains to be seen what quality of data is reported in practice. The scope of biennial update reports is to provide an update to the most recently submitted formal national communication to the UNFCCC in the following areas (although this is rather a qualitative than a quantitative request so far):

- Information on national circumstances and institutional arrangements relevant to the preparation of the national communications on a continuous basis;

- ▶ The national inventory of anthropogenic emissions by sources and removal by sinks of all greenhouse gases (GHGs) not controlled by the Montreal Protocol, including a national inventory report;
- ▶ Information on mitigation actions and their effects, including associated methodologies and assumptions;
- ▶ Constraints and gaps, and related financial, technical and capacity needs, including a description of support needed and received;
- ▶ Information on the level of support received to enable the preparation and submission of biennial update reports;
- ▶ Information on domestic measurement reporting and verification.

4 Summary of progress on sectoral approaches in the CDM and emerging UNFCCC mechanisms

Despite changing terminology and definitions, the historical debate on a sectoral CDM offers some important early insights into some of the most relevant political, institutional and technical aspects of various sectoral approaches. The distinction between a project-based versus policy-based sectoral mechanism was initially not very clear with overlapping notions between a sectoral aggregated project-based mechanism and an approach that operates with setting standards or different sets of incentives. This distinction has become more and more explicit, by gradually introducing programmatic activities and standardization of baselines and other methodological elements into the CDM, while other concepts have moved to emerging mechanisms.

PoAs have established themselves firmly within the CDM framework, and are set to achieve significant improvements in line with the political objectives of the CDM regarding sectoral and geographical distribution. Some PoAs can be considered to come close to sector-wide upscaling of mitigation actions, provided they will be fully implemented (see table 2). However, market and political uncertainty are currently inhibiting implementation of many CDM activities after a rapid build-up of the PoA portfolio in 2012. Yet, the rather cumbersome consolidation of the regulatory framework for PoAs illustrates typical teething problems when developing the nuts and bolts of procedures and standards, which can be expected for any new approach or mechanism. However, the PoA concept enjoys a high degree of acceptance, and its value is recognized beyond the CDM. There is a broad range of voices and conceptual studies that explore how the PoA approach can be integrated into emerging mechanisms including NAMAs and the NMM (Lütken et al. 2013, Füssler 2012, Cocco et al 2011).

The stock-taking exercise above has also shown that CDM standardization introduces further sector-orientation into the CDM, as SBs need to consider data from the entire sector, and will be – possibly mandatorily – applicable to all CDM activities of the same type in the respective country or region. Still, it has also become clear that the standardization process is still in an early stage, and needs to evolve further. For instance, it is not yet defined how to prepare a PoA-DD with a standardized baseline that is in the process of being developed but not yet approved. More importantly, the effects of standardization on the environmental integrity of the CDM cannot be assessed yet. A key question for the future evolution of the standardization reform programme is to be aware of a potential “trade-off between the transaction costs of a market mechanism and its environmental integrity. Therefore, researchers and practitioners need to assess carefully, ideally on the basis of empirical evidence which project types lend themselves to standardization under which circumstances” (Michaelowa 2012, p.43). If done right, standardization may lower transaction costs and access barriers significantly, although upfront efforts by public actors are necessary to harness such benefits. This aspect relates to the balance between top-down and bottom-up standardization, driven either by the UNFCCC or by host countries and their partners themselves. The higher the degree of standardization in existing CDM methodologies, the more efficient and effective further country-specific standardization is, as it lowers complexity and workload for DNAs and reduces the need for country-specific data. Similarly to PoAs, the current political and market uncertainty is a key barrier for harnessing the potential of these initiated reforms and its first results for both further evolution in a reformed CDM and emerging UNFCCC mechanisms.

Both of these sectoral approaches are now fully operational even though they remain in early stages of implementation. As the CDM policy dialogue has noted, in particular

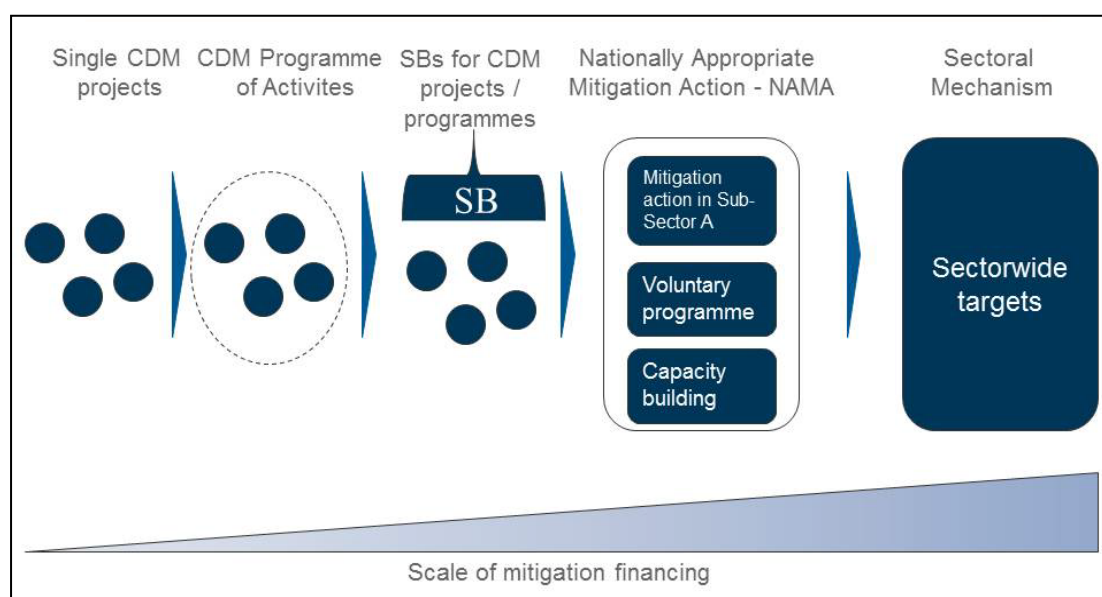
their increasing combination (using SBs and standardized methodologies in a PoA) has the potential to achieve a significant move towards the sectoral level within the existing CDM (CDM Policy Dialogue 2012 p.27), or a reformed “CDM+”⁷. This demonstrates the responsiveness of the CDM’s regulatory framework and governance architecture, even though the criticism and politics have already moved on to other issues such as net mitigation. Other more policy-based sectoral approaches have not been taken up in the CDM, but have largely diffused into the debate on emerging concepts for NAMAs and new market mechanisms. The most relevant approaches here are sectoral crediting and trading under the NMM. A rather conceptual approach is NAMA crediting. These are not operational yet, and – regarding the latter - the idea of a credited policy mechanism has not yet gained acceptance within the UNFCCC process. Still, there is a conceptual discussion taking place on an expert level, as well as also first moves towards implementation outside of the UNFCCC e.g. in the context of the Partnership for Market Readiness or concepts that blend carbon markets with climate finance.

Looking at emerging UNFCCC mechanisms, NAMAs today provide the most mature set of the juvenile activities under preparation or implementation, while the NMM and even more the FVA remain vague options in the political discussion. Still, converging views indicate that the most likely concepts for NMM, FVA and NAMAs are envisaging mitigation action with a stronger sectoral scope that may include policy-based approaches. In addition, sector-specific approaches are beginning to emerge as complementary for sectors that have either not been taken up in the CDM (REDD, aviation, shipping), or could even be phase out of the CDM for political reasons. Here the “artificial” debate on NAMAs comes in, which are not expected to evolve into a separate non-market mechanism, but be accommodated under NAMAs or FVA, or UNFCCC finance fora.

These emerging sectoral mechanisms are likely to be more diverse than the CDM. They could, for instance, cover not only one multilateral market mechanism which would cover theoretically all sectors, but could also include a variety of different “sector-specific mechanisms”, which are designed specifically for (sub)sectors with highly idiosyncratic features. Some tendencies in the most important high-impact sectors are already discernible (HFCs, aviation, shipping). These are likely to be assembled under FVA, although the governance architecture remains an open question. Standardisation and streamlining of PoAs could help achieving several of the EU’s policy objectives for sectoral crediting through the use of conservative SBs on the one hand and streamlined approval and inclusion procedures on the other. This would help ensure that fewer credits are issued than actual emissions reductions achieved and enable the more rapid scaling up of the carbon markets. One could also integrate PoAs into credited NAMAs, or into other mechanisms. Figure 8 illustrates possible pathways for scaling up market mechanisms into sectoral approaches.

⁷ We use the term “CDM+” to refer to a future (improved) CDM after the scheduled review of its modalities and procedures, and further standardization of methodologies, maturation of the institutional design and administrative processes.

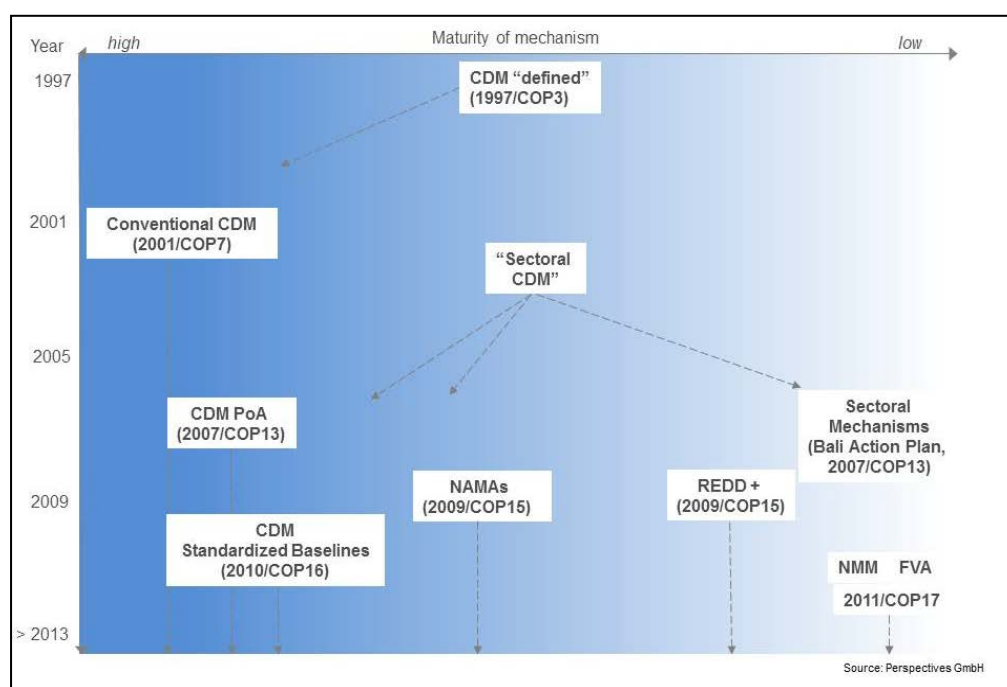
Figure 8: Scaling up Market Mechanisms



Source: Perspectives GmbH

Figure 9 illustrates how both existing and emerging mechanisms have evolved over time, in order to draw attention to duration, linkages and maturity of the various mechanisms.

Figure 9: Evolution of UNFCCC Mechanisms



Source: Perspectives GmbH

Looking ahead, a key question is how these sectoral approaches will continue to evolve. SBs and PoAs are likely to continue to be improved and consolidated within the CDM framework, but also to diffuse into NMM, FVA and NAMAs. Which specific aspects of

which sectoral approach may evolve in which direction, and how, depends on many factors. These include the paths that the political UNFCCC negotiations may take: the debate on new mechanisms is progressing only very slowly, and concern over the lack of ambition on finance and mitigation, as well as the resulting CER market depression overshadows technical discussions. Other inputs originate from contexts that have traditionally not been at the centre of the debate on sectoral approaches. For instance, the rise of importance of the climate finance issue, in tandem with the market crisis, has led to a stronger focus on the interactions between carbon markets and climate finance, e.g. through results-based financing. Such approaches are already quite prominent e.g. with in REDD and the GCF, but are a rather recent trend in the CDM context. For instance, the UNFCCC's Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP) negotiation stream calls for "unlocking opportunities for raising pre-2020 ambition", and mentions the option of voluntary CER cancellations for this purpose. A dedicated cancellation account for this purpose has now been set up in the CDM registry. It can be expected that such discussions will rise in importance, as it is clear that sectoral approaches, which are supposed to operate at larger scales than the CDM need to establish more effective price volatility control mechanisms. It is inconceivable that any government or private sector actor would agree to deep and potentially costly mitigation actions without a sufficient level of certainty on anticipated support with finance, technology and capacity building. A more thorough evaluation of such possible developments of the identified sectoral mechanisms, and their potential to inform the development of the NMM and NAMAs will be the subject of chapters 5 and 6.

5 Evaluating the potential of sectoral approaches for NMM and NAMAs

Based on the assessment in chapter two to four, we define indicators for evaluating the feasibility and practicality of utilizing the identified conceptual elements for NMM, FVA and NAMA approaches. Consistent with the previous analytical steps, we distinguish between indicators in institutional, technical and political categories. Applying these indicators to selected sectoral approaches will allow for a structured evaluation of possible challenges and solutions.

- ▶ Which approaches are suitable for further evolution under the NMM, and potentially the FVA?
- ▶ Which approaches are more likely to be integrated into NAMA frameworks?

In a first step (5.1), we outline a catalogue of indicators for a structured analysis of the various sectoral approaches that have been identified above:

- ▶ Standardized Baselines, SB
- ▶ Programme of Activities, PoA
- ▶ Sectoral crediting and trading,
- ▶ domestic policy instruments.

Second, we discuss the potential of these elements for further evolution within the CDM, but primarily within NMM/FVA and NAMAs (5.2). In particular when assessing the potential for future evolution, we may draw on developments and evidence that go beyond narrowly understood debates on sectoral approaches, e.g. regarding international climate finance, or bottom-up initiatives from outside of the UNFCCC process. Finally, we sum up these rather complex debates in reader-friendly tables which allow for a quick overview of the key results and messages (5.3).

5.1 Indicators for evaluating sectoral approaches

Based on the assessment in chapter two to four, we define indicators for evaluating the feasibility and practicality of utilizing the identified conceptual elements for NMM, FVA and NAMA approaches. Consistent with the previous analytical steps, we distinguish between indicators in institutional, technical and political categories. Applying these indicators to the various sectoral approaches will allow for a structured evaluation of possible challenges and solutions.

Table 5: List of indicators for evaluating sectoral approaches

	Nr	Indicator	Explanation
Institutional	1	Administrative requirements	What is the role of the UNFCCC (COP/CMP), project cycle bodies and host country bodies?
	2	Regulatory requirements	Which authority will be located at UNFCCC (COP/CMP), and which at host country level? (centralized- decentralized approach)
	3	Role of third-party	Competences and required tasks of international and/or do-

Technical		auditors	mestic auditors
	4	Capacity requirements	Which competences are required by various actors groups (UNFCCC, national governments, market participants), and which capacity gaps exist?
	5	Data requirements	Considers data availability, quality and processing requirements and principles
	6	MRV infrastructure and processes	Which data and which level of aggregation and complexity is necessary; requirement for international and/or domestic auditors (desk review, on-site visits); registries
	7	Prevention of double counting	Role of registries, other (sector-specific) regulatory measures
	8	Eligibility	Which criteria and approaches are used to define eligibility (additionality), and who has the authority to decide over them
	9	Transaction costs	Considers level of transaction costs (high-mid-low), but also who has to bear these cost (donors, host country governments, market participants?)
	10	Incentive structure	Are financial incentives given ex-ante / ex-post? And is an approach exposed to, or reduces or enhances “resilience to market volatility”?
	11	Net avoidance effects	Considers “ambitious” baselines, discounting, crediting periods
Political	12	Scope of mechanism/measure	Relates to the sectoral and geographical scope, and describes boundaries for mechanisms (e.g. sectors), and how existing CDM activities would be integrated into the new mechanism or not. Distinction between "established CDM sectors" or "untapped sectors" (with less experience), could potentially include UNFCCC-external sectors: REDD, aviation and shipping, HFCs)
	13	Timeline to implementation	Whether a sectoral approach is likely to become operational/implemented pre- or post-2020
	14	Political feasibility	Considers the impact of host country position towards market mechanisms, domestic lobby groups in specific sectors, and membership of host country in UNFCCC negotiation blocs with relevance for market mechanisms

Source: authors

5.2 Opportunities for developing sectoral approaches under NMM and NAMAs

The set of indicators developed in 5.1. will be applied to the selection of conceptual approaches that have been identified in chapters 2, 3, 4:

- ▶ Standardized Baselines
- ▶ Programme of Activities
- ▶ Sectoral crediting and trading
- ▶ Domestic policy instruments with regulatory / non-market character

Each of the indicators introduced above will be applied to these sectoral approaches. This step allows for evaluating whether these could evolve further within a CDM with reformed modalities and procedures (to which we refer to with the preliminary term “CDM+”), and whether they are more likely to be applicable to NMM/FVA, NAMAs, or both. As the previous chapters have shown, each of the sectoral approaches comprises a broad range of – sometimes complex – aspects that can be more or less applicable in different mechanisms. The indicator set will therefore allow developing a refined understanding as a basis for evaluating the potential of a certain aspect of a sectoral approach (e.g. net mitigation through SBs) for a specific mechanism (e.g. NAMAs). Regarding data and information sources, this chapter draws on the stock-taking in chapters 2-4, as well as responses from a set of semi-structured expert interviews that have been conducted specifically for this research report. In order to align the subsequent steps in our analysis, where appropriate, we distinguish between the three stakeholder groups, which are the centre of chapter 6 (UNFCCC, host countries, market participants).

5.2.1 Developing sectoral approaches based on CDM standardized baselines

Institutional dimensions

(1) Administrative requirements: SBs have only recently generated EB guidance and procedures for how to process and assess data for entire sectors rather than individual projects. These define slightly new roles for the CDM support structure (Secretariat and working groups). These procedures can be seen as an evolution of conventional methodology approval, and are still rather new and are likely see further elaboration and consolidation within the CDM. These new tasks show that the established organizational structures of a mechanism can adjust to new responsibilities, which will result from introducing new sectoral approaches. For host countries, SBs require maintain and update data on entire (sub-) sectors, which inform SB establishment. As one interview explained, the “Host country level is more important under NMM than under CDM. DNA is a good starting point. It has to be build early, of course there will be new tasks in terms of MRV, methodologies because further tasks will be required” (Interview No.2). This is the key reason why the SBs are widely seen as highly transferable to a broad range of project-based, programmatic, and to some extent policy-based approaches. Therefore, SBs can serve as baselines or thresholds for **both NMM and NAMAs**.

(2) Regulatory requirements: As with all CDM-related aspects, the CMP retains political oversight, and the EB remains the key actor that has the authority to approve or revoke SBs, and thus safeguard the integrity of the approach with a relatively high degree of neutrality. This is critical as SBs can have strong or weak environmental integrity, depending on the quality of data. Looser regulatory arrangements increase this risk. A CDM-like centralized institutional design could be either replicated or extended to the

NMM, which depends on the elaboration of the NMM's M&P. By contrast, such functions seem less likely for **FVA** and **NAMAs**, which are likely to operate more decentralized and country-driven. However, CDM SBs may become benchmarks with regard to conservativeness for other mechanisms that establish their own baseline standards. SBs can also be used as elements of a non-CDM methodological framework, e.g. for MRV of a supported NAMA feed-in tariff (Michaelowa and Hoch 2013). Host country DNAs are the only actors that can perform QA/QC checks and submit SBs, or, in case of multi-country SBs, submit LoAs, and update, represent new role for DNA which comes close to soft sector oversight. This multi-country dimension should certainly be transferred to both NMM and NAMAs.

(3) Role of third party auditors: The key DOE role is to prepare an AR of the SB which is similar to validation. Therefore, sectoral upscaling could theoretically be fostered by easing validation requirements for PoA-DDs and PDDs which use approved SBs. Within the NMM, it is likely that auditors will require UNFCCC accreditation similarly to DOEs, although NAMAs and FVA approaches may allow entities that demonstrate their competence otherwise, e.g. through International Organization for Standardization (ISO) certification. One needs to consider, however, that the key challenge here is “not about whether an auditor has competences, but also specifically about the tasks that need to be performed – we have to be sure that they (auditors) perform the right tasks and that needs to be defined” (Interview Nr. 5). ARs offer experiences which can contribute to defining such requirements for all other sectoral mechanisms.

(4) Capacity requirements: Regarding UNFCCC actors, the CDM support structure has built up a considerable level of expertise which is currently underused due to lower inflow of projects. SB-related tasks are roughly comparable to methodology development. However, for host countries, SBs represent a step-change, and require building substantial capacity for QA/QC procedures and comply with continuous data requirements. Only a few countries have submitted SBs, therefore, it is not clear how effectively this will be implemented. For market participants involved in developing SBs, a level of capacity similar to methodology development is required and considerably lower than previously if a SB is readily available, as a key part of the requirements are already fulfilled. It is clear that these efforts are currently made possible primarily through donor support rather than the market. The related political uncertainty raises challenges related to whether a government or company should invest in building such capacity:

I sometimes don't understand why there is capacity building - for so many governments, really smart people are tied up in these mechanisms, and now the market is dead. It does not matter what the name of the mechanisms is, but that is a really unfortunate situation, that should be avoided (Interview Nr. 10).

Technical dimensions

(5) Data requirements: Data requirements are defined by CDM methodologies, specific SB establishments, or QA/QC guidelines (see section 2.3). As explained in (1) these typically cover an entire sector and need to be updated and revised by the DNAs. Previously, such tasks needed to be conducted by the PPs, who then had their baseline validated by a DOE.

(6) MRV infrastructure and processes: MRV requirements are defined by CDM methodologies. SBs are merely on methodological tools, and therefore operate fully within the CDM infrastructure. Innovations include the AR, the possibility of top-down SBs and revisions, as well as the relatively short validity period of only three years.

(7) Prevention of double counting: SBs do not directly contribute to double-counting, but enhance comparability across countries. Using SBs in mechanisms with a less mature infrastructure than the CDM, which at this stage applies to both **NAMAs and the NMM** may contribute indirectly to prevent double claiming.

(8) Eligibility: The use of SB is likely to become mandatory in order to prevent ‘cherry-picking’ or ‘methodology-shopping’. SBs can optionally define automatic additionality e.g. through positive lists. These are **currently** only available for small-scale technologies, but could theoretically be expanded to other scales in any sector as long as environmental integrity is preserved. This represents a direct link to the degree of net mitigation, i.e. the more the offsetting component of emission reductions is decreasing, at least from a climate perspective (not one of economic efficiency). The application of this SB aspect is transferable to **NMM and NAMAs**.

“SBs have good potential for reducing transaction costs, and are currently gaining first experiences. Though, on a sectoral level still one would have individual activities that have to be designed, monitored and verified. This would not significantly reduce transaction costs. Though, one particular aspect why the CDM worked is that individual action was credited. So that’s a bit of a dilemma – moving away from individual action, and still aiming to use instruments that were designed for individual projects. Not sure whether this is the best solution. In any case PoA/SBs would need to be altered to fit a sectoral approach.” (Interview No. 3)

(9) Transaction costs: SBs may significantly lower TA for market participants, as default values are provided. The costs for their establishment, however, have effectively been shifted from the Project Participants (PP) to public actors, both UNFCCC (in case of top-down SBs), and host country DNAs (for bottom-up SB). This results in comparatively high transaction costs for these two, which may result in limitations of the concept.

(10) Incentive structure: remains ex-post, but SBs increase certainty on the volume of expected CER yields, as the baseline is pre-determined for all activities in the entire (sub)sector, sometimes even across countries. This also means however, that a PP has little incentive to invest in a SB, as all competitors would be able use it freely. This may further require public work. In addition, CER prices continue to depend on market fluctuations. RBF is a concept that seems to enjoy an increasing popularity within the UNFCCC space, and SBs can be excellently integrated such designs as several donor initiatives are now beginning to demonstrate. For **NMMs**, price volatility mitigation mechanisms are highly recommendable; in particular as deeper emission cuts for broad segments imply high risks.

(11) Net avoidance effects: Conservativeness as a key CDM design principle already ensures some limited net mitigation effects (Interview Nr. 10). However, these remain intransparent as they are typically not quantified (Lazarus et al. 2013). More “ambitious baselines” may amplify this effect, but require further regulatory evolution. As one possible avenue, the JCM has established the concept of BAU emissions (similar to baselines), reference emissions (other threshold) and project emissions. The difference between reference and project emissions can be credited, whereas the difference between BAU and reference emissions is described as net mitigation effects (Government of Japan 2014). This provides a useful framework, although the conservativeness of the respective values is critical for the integrity of such attempts to account for net mitigation. However, it is important to recognize that the CDM has not been designed to achieve net mitigation, although offsetting is only one option of using CERs. As one interviewee put it:

“Net mitigation is important because there is a lack of ambition. If the whole world would be covered by targets, you wouldn’t need net mitigation anymore. It is also important what you assume about the ambition level of a country or mechanism for net mitigation.” (Interview No.5)

Political dimensions

(12) Scope of mechanism/measure: SBs are open to all CDM eligible sectors, although the CMP has mandated the EB to develop specific guidance for priority sectors⁸. Subsequent political decisions could broaden these work programs to further desirable sectors (e.g. those with high SD impact). In practice, SBs have so far focused on typical CDM sectors like power generation, two of the three priority sectors (transport, agriculture) have seen very limited CDM uptake. Regarding geographical scope, SBs could theoretically easily be transferred to advanced emerging economies. In some countries, “the CDM has not been taken up in the most important sectors, such as fisheries and mining.” (Interview Nr. 12)

(13) Timeline to implementation: SBs are fully operational. As mentioned in (2), the CDM’s regulatory framework continues to contribute to a toolbox of methodological elements which can also be utilized for other mechanisms. This is particularly relevant for pre-2020 implement, as all other mechanisms have no (NMM) or only embryonic infrastructure of their own (NAMA). A political decision is required to integrate the concept, procedures and governance architecture into the NMM, whereas the vagueness MRV procedures for NAMAs already allows for the use of SBs for supported and credited NAMAs.

(14) Political feasibility: SBs are one of the few items on which the CMP has issued guidance, there is a work programme for further evolution until 2015 in place, and the concept enjoys a relatively high degree of acceptance. Due to market situation, the SB development has been practically restricted to LDCs. In lieu of a recovery of the CDM market, extension of SB to development to middle and high income developing countries for those countries and sectors that do not develop full-fledged ETS. For adoption into non-market approaches, this may require some initiative and openness on the side of donor countries and multilateral development banks (MDB) or climate funds, which determine the M&E frameworks for climate finance approaches that could potentially use the CDM framework to measure performance.

Brief summary and assessment

Regarding the majority of indicators, this analysis revealed that SBs are highly applicable for both NMM and NAMA mechanisms. On a most fundamental level, this is because SBs are established based on performance of (sub)sectors, not projects. Sometimes differences between SB applicability for NMM or NAMAs emerge, e.g. with regard to the degree of centralization of regulatory requirements. In other instances, e.g. with regard to the capacity and transaction cost indicators, it is important to differentiate between stakeholder groups, as simplification for market participants may mean higher transaction costs and more complex capacity requirements for host countries and/or UNFCCC bodies. One interviewee remarked that “the idea of applying SBs across a sector is a very important idea that needs to be implemented in the new market mechanisms. It offers very strong argument for new mechanisms - simplify, transaction costs. Of course it costs more upfront, but then simplifies implementation.” Importantly, the CDM standardization process is still recent, but now fully operational, and can in theory be ex-

⁸ Energy in isolated areas, transport, agriculture. SB guidance for afforestation and reforestation already exists.

tended to additional CDM sectors, or transferred to other mechanisms that more directly on sectoral approaches like the CDM, including those that emerge from outside of the UNFCCC.

5.2.2 Developing sectoral approaches based on Programme of Activities

Institutional dimensions

(1) Administrative requirements: Regarding the UNFCCC, PoAs operate largely within CDM methodologies, project cycle, and support structure. A key difference is to process CPA inclusion into existing PoAs, which also results in different MRV provisions. For host countries, PoAs do not require new responsibilities beyond a LoA, as the all the methodological work remains delegated to the PPs. For market participants, a considerably higher administrative effort results in managing a CME, although it is possible that an organization can join an existing PoA with significantly less administrative hurdles. In case of multi-country PoAs, the CME can be located outside the country, which may exacerbate the problem of stakeholder consultations and other steps. Taking these concepts further to both **NMMs and NAMAs** through quasi sector-wide PoAs may require a public sector CME, which already exist in some sectors that are typically in public sector dominated (waste, transport).

(2) Regulatory requirements: Similarly to SBs, PoAs operate fully within the CDM framework, and are subject to project cycle and methodologies. It is important to recall that, similarly to standardization, the PoA concept has been formally introduced to the existing CDM by a COP decision (UNFCCC 2006), which is an indication of the responsiveness of the CDM's regulatory framework to legitimate criticism. PoAs have generated an even more comprehensive set of procedures and guidance compared to SBs, as the concept has been introduced much earlier. For host country DNAs there not many changes, the main requirements remain LoAs. Yet, it is important not to under-estimate the important of effective sector-specific regulation (not CDM specific), for which the DNA is not responsible, but could make the effort to promote harmonization with CDM or other UNFCCC mechanism requirements.

(3) Role of third party auditors: Although both validation and verification remain necessary of PoAs, CPA inclusion does not necessarily require validation. The issue of DOE liability shows that the details of an innovative sectoral approach can take several years to be resolved. This is likely to become more relevant for upscaled approaches.

(4) Capacity requirements: For the UNFCCC, the key challenge was arguably to develop the regulatory framework for PoA development, which can now be considered to be largely in place and somewhat consolidated. For national governments, there are no fundamentally new requirements for host countries. For market participants, however, the complexity of aggregating activities within the PoA umbrella can be very high, in particular when using methodologies with a low degree of standardization and involving multiple CPA implements (potentially in multiple countries and jurisdictions. However, in particular for smaller organizations without CDM experience, the option to join an existing PoA umbrella can mean significantly lower capacity requirements. Both NAMA and NMM approaches can be expected to increase capacity requirements for host countries, although there is little clarity on the specifics from the UNFCCC level. Therefore, there is a complete absence of market participant capacity on NMM. NAMAs have gained a bit more attention, but remain primarily government driven at this stage.

Technical dimensions

(5) Data requirements: UNFCCC and host countries, not differences compared to project-based CDM. However, it is important to be aware that PoAs have opened the CDM to very small scale mitigation activities even on a household level. For market participants, this means that many new developments in (sometimes informal) sectors with very poor data availability and/or reliability were required, resulting in the need to conduct extensive surveys on the ground. Increasing standardization, based on consolidating empirical research removes many of these needs, increasing applicability and therefore potentially scale. One interviewee stated that

it is very good that it started to aggregate various installations, including large installations, and can thus be already very close to a sectoral approach – if it evolves to compulsory participation then we are in a sectoral approach – we have moved from one dimension to another one – if we have moved from PoA with small activities to large one, if we achieve comprehensive participation to avoid leakage (Interview Nr.2)

(6) MRV infrastructure and processes: The potentially large number of CPAs that can be grouped within one PoA umbrella, have led to some innovative MRV approaches, e.g. with regard to sampling (even across CPAs) and validation (see 2.3). One interviewee remarked that

the CDM is a very important experience and is an excellent basis to further new market mechanisms, most relevant are PoA and SBs. CDM elements will not be used 100% the same. But for instance, let's take the MRV aspect – it is a huge experience that can be further used. The methodologies will probably not be used one by one – even more for sectorals, but it is still very important

Remaining issues synchronized verification should be abandoned. Increasing CDM standardization will remove the need to conduct surveys for PoAs, as has recently been achieved e.g. in methodologies for improved cook stoves and sustainable charcoal production.

(7) Prevention of double counting: PoAs do not directly contribute to prevention of double counting, although resulting CERs and the centralized UNFCCC CDM registry, operated under the authority of the EB, form a basis to prevent double counting. The NMM will certainly require similar accounting systems and registry infrastructure, although the scope is so open at this time, that it is not clear which units are relevant, and what the balance between global and national levels will be. Yet, it is also likely to draw on UNFCCC infrastructure, although for sector-wide approaches or tradition with international scope, common accounting frameworks and the role national registries and their linkages with UNFCCC system becomes more important.

(8) Eligibility: The key issues are additionality, but also – more innovatively – CPA eligibility. To ensure compatibility, PoAs drawn upon CDM methodologies, specific additionality tools and SBs, as well as any related guidance. These lessons concerning the compatibility of the underlying approaches – allowing for eligibility of the resulting emissions reductions – could be transferred to **both NAMAs and the NMM**. As an innovative variation, a sector-wide approach such as an STM with compulsory participation could transfer the CME concept to the public sector (regulator), and assign a quasi-CPA role to individual participating entities. This is relatively far from the CDM's baseline-crediting approach, but some lessons could be learned for NMM.

(9) Transaction costs: On the UNFCCC level, elaborating PoA rules can be considered to have been the key effort, which has consolidated after. For host countries, transaction costs are similarly low than for conventional CDM projects. For market participants, transactions costs have initially been very high, but may be simplified through increasing standardization (see 3.4). Potentially low transaction costs for standardized CPA

entry. Section 2.2 has demonstrated that even small-scale methodologies can now lead to some very large emission reductions.

(10) Incentive structure: financial incentives typically accrue ex-post, and their value is dependent on market fluctuations. It needs to further elaboration until a sectoral approach can be seen in nascent initiatives such as Ci-Dev, which already pilot RBF approaches based on PoAs. Even more innovative concepts could limit crediting periods in exchange for provision of upfront finance, which would some of the incentives to ex ante. Climate Investment Funds have piloted this implicitly by some funding windows, although the approach was very much project-based similar to conventional multilateral lending with grant elements. De facto, however, this could be seen as a pilot phase for one possible variety of credited NAMAs, although the mitigation impacts of the NAMA and CDM components of such activities need to be made more explicit.

(11) Net avoidance effects: Conservativeness as a key CDM design principle establishes a likely net mitigation aspect (Lazarus et al 2013, Interview 12). For the UNFCCC, the cancellation account is potentially a key net mitigation instrument. In addition, innovative RBF mechanisms based on CDM methodologies could harness the performance-based character of CDM PoAs, but circumvent the currently depressed market by paying above-market prices. To some extent, credits generated under Ci-Dev will be retired, leading to direct net avoidance effects, which demonstrate that offsetting is only one option under the CDM. For market participants such RBF mechanisms are attractive as they enhance certainty. However, such approaches require willing financiers, although there may be a stronger institutionalization of such linkages between carbon markets and climate finance in the future.

Political dimensions

(12) Scope of mechanism/measure: PoAs have enabled access to the new sector with high relevance for under-represented countries, thereby enhancing not only sectoral but also geographical balance in the CDM portfolio (a key objective of the multilateral CDM). Later, large-scale methodologies have been allowed to operate as PoAs. The effort of the Secretariat to screen all relevant CDM methodologies for “PoA compatibility” is currently ongoing. Some restrictions still apply (exclusion of cement sector). Yet, the transfer potential is high, including for innovative approaches such as sector-specific RBF mechanisms, which could function as a **NAMA**. For some sectors such as agriculture (soil carbon), the PoA concept has initially been taken up primarily in voluntary carbon standards, although these could be integrated into compliance mechanisms **NAMAs**. PoAs also have high relevance for NMM, as most NMM proposals focus on programmatic or policy-based approaches. For policy-based approaches, PoAs require further adjustment, in particular with regard to baseline identification and attributability of emission reductions.

“The role of PoAs and SBs depends on the sector. PoAs could work for dispersed applications such as CFLs or cook stoves, while they are not so much suitable for large scale applications (as PoAs still need to monitor all activities, and you would require a large amount of activities for making use of sampling procedures). So for large point sources PoAs are essentially a bundle.” (Interview No. 3)

(13) Timeline to implementation: PoAs are fully operational, and the concept has established itself firmly within the CDM’s regulatory framework. Extension to further sectors and scales is possible both within and beyond the CDM virtually immediately. The PoA approach could evolve further within the **CDM** by extending is, **as well as both within NMM and NAMAs**. However, lack of clarity procedures makes it unlikely that larger

scale-rollout happens before 2020 within the **NMM**. Yet, RBF-based NAMAs could be rolled out virtually immediately, as the CDM registry and the cancellation account are already in place.

(14) Political Feasibility: The initial results of early PoA implementation are fully in line with CDM reform expectations (scale, geographical and sectoral balance), and have contributed to the high degree of acceptance of the PoA concept. This directly translates into potential applicability for both NMM and NAMAs. However, the rapid decrease in PoA inflow after 2012 demonstrates the vulnerability to policy uncertainty, CER ‘under demand’, and market volatility, similar to conventional CDM projects. For host countries, buyer countries have also shown a particular interest in supporting specifically PoAs through initiatives by a range of European governments. A critical precondition for further evolution towards sectoral levels is the continued attention to methodological evolution in particular in priority sectors with high sustainable development impacts but barriers such as data availability, as well as innovative combinations of CDM and climate finance vehicles, which could then be structured as either a **NMM or NAMA**.

Brief summary and assessment

Similarly – as is the case for SBs – PoAs are also highly applicable to both NMM and NAMAs. A critical difference to standardization is that PoAs have not engaged host countries as much, but directed most efforts primarily to PPs, and to some extent to the UNFCCC. This can be expected to shift considerably for both NMMs and NAMAs, raising fundamental questions about capacity and the viability and integrity of some institutional and technical aspects. More positively, this analysis has also found evidence for the proposition by the CDM Policy Dialogue that the combination of standardized approaches and PoAs can be powerful combination in terms of simplifying applicability, e.g. with regard to MRV (see 8), which may become relevant for all possible future mechanisms. This is a key precondition for facilitate upscaling towards sector-wide approaches (by lowering the barriers for uptake). Other critical further possible developments for NAMAs include RBF approaches based on PoAs, which could be seen – from a strictly conceptual perspective as a variety credited NAMAs, although they are usually not framed this way. More fundamental adjustments are necessary to adjust the PoA concept – particularly the CME – CPA relationship for STM and SCM type of NMM approaches, which is likely to require a shift of responsibilities from CMEs to host country government authority, raising a range of challenges from capacity and governance architecture to incentive structure design.

5.2.3 Developing sectoral approaches based on crediting & trading mechanisms

In this section crediting and trading approaches as per the EU’s proposals for sectoral crediting mechanism or sectoral trading mechanism are discussed, and we evaluate their feasibility for accommodation under the NMM or NAMAs. The discussion for feasibility under the FVA is set aside due to its more than speculative nature at this point – the discussion on the NMM is already speculative enough given the lack of agreed definitions and approaches from negotiations. As the future shape of the FVA is even vaguer, any discussion going into such detail would result in redundancies with the NMM discussion or be pure speculation. It is quite clear that the EU’s approach for crediting and trading is designed for the NMM. The result of the subsequent assessment is that the NMM is essentially better suited for crediting and trading. We nevertheless also consider NAMAs as a possibility for developing sectoral crediting or trading approaches

– for the simple reason that NAMAs are operational today, in contrast to the NMM. While NAMAs could in fact accommodate a crediting approach, this is still a contentious element in expert discussions and not officially debated under the UNFCCC so far.

Institutional dimensions

(1) Administrative and regulatory requirements: Sectoral crediting and trading approaches are intended to work under – and as we have seen require – a centralized mechanism, with a clear set of rules determining the process. Given that this likely happens on the national governments' level, international oversight is required for ensuring comparability and minimum quality standards. Here the UNFCCC (COP/MOP) can take a supervising role (e.g. by approving modalities and procedures). For the crediting approach CDM bodies would not be involved in the first place, but some parts of the CDM infrastructure could be copied (e.g. a supervisory board related to CDM EB, Meth Panel, working groups, etc.). For trading, the CDM body would not be required, apart from maybe accreditation aspects for third party auditors.

“[The] Host country level is more important under NMM than under CDM. [The] DNA is a good starting point. [Such an institution] has to be build early; [and] of course there will be new tasks in terms of MRV [and] methodologies because further tasks will be required” (Interview No.2).

As these approaches move away from the level of individual emitters and more towards the government level, the capability and political will of national governments for credible and consistent action becomes way more important under both crediting and trading approaches for defining and enforcing the domestic action. One interviewee observed, that *“an important, if not core aspect is the enforcement of action. Here the responsibility of governments is very relevant.” (Interview No. 7).*

Under a trading route the responsibility of the government is even higher, given that binding targets (cap) are to be met and thus careful preparation of a trading scheme is essential. Also given that the stakes are much higher in such a case of a binding cap, incentives may be greater to allow for a relaxed and ineffective target setting or design of the rules of the trading mechanism. Sectoral bodies or associations could also play a role, but would probably not have enforcement power (e.g. national building council) to incentivize behavioural changes, but could rather provide complementary guidance. From what we know today about the structural setting of the **NMM**, crediting and trading would clearly correspond with the administrative requirements expected under the NMM. Some **NAMAs** already today involve the national government (e.g. ministry of the environment) for administering the program; hence NAMAs with strong governmental involvement could also be suitable to accommodate crediting or trading approaches – from an administrative point of view.

(2) Role of third-party auditors: As credits shall certify emission reductions, third party auditing would most likely be required. However, on the governmental level, scrutiny should rather address sector inventories than individual actions. For project level auditing, CDM DOE's would be best suited and could cover the tasks. They would however need to be accredited in some form for the new sectoral scope through the UNFCCC to ensure they are able to deal with the broader nature of the mechanism. For the former – the governmental level – the international consultation and analysis (ICA) process with

its review experts could become relevant.⁹ In case of a trading approach, auditing would be required particularly for reporting/verification of reductions on the sector level. Here (domestic) experts with expertise in the particular sector could come into play, e.g. under an international roster of experts.

The decision at COP 19 regarding the review of Biennial Update Reports (BUR) of developing countries was that the teams executing this task should comprise of a majority of experts coming from non-Annex I Parties. MRV of unilateral **NAMAs** will not be subject to any international scrutiny due to the limited stake of the international community in such mitigation actions. CDC Climat (2013) expects that in the long run, MRV of supported NAMAs could look like the MRV of REDD+ agreed in Warsaw¹⁰, however, the language on MRV of supported NAMAs is currently very soft, and does not seem to allow for the necessary level of transparency and comparability. While NAMA developers currently often aim to orient themselves towards the standards set by CDM methodologies and include elements of verification, this is a voluntary choice based on the expectation that in the future more stringent rules might apply. Furthermore the MRV depend to a large degree on the specific requirements that donors may have in a supported NAMA case and given the limited financing mobilized for the implementation of supported NAMAs these requirements are quite uncertain and likely to show strong differences between sectors and the types of donors engaging. The text on the **NMM** states clearly that the modalities and procedures need to regulate third party auditing, and that its implementation would most likely require auditing. Generally, the idea of third party reviews as well as an international review process is widely supported in the negotiations on the NMM. Given the market based nature of crediting and trading it is more likely that sufficient auditing could be achieved under the NMM rather than in the case of NAMAs.

(3) Capacity requirements: Internationally capacity for a supervising body would be required, both in terms of technical expertise and financial support. While the UNFCCC Secretariat could certainly provide for some parts of this infrastructure, the history of the CDM EB has demonstrated that it takes time and resources to build up and maintain a body that is sufficiently equipped for working smoothly. On the government level full capacities for setting up a crediting approach are required, including administrator at government level (e.g. unit in ministry), registry and processing units (such as Deutsche Emissionshandelsstelle, DEHSt), expertise for defining baselines and targets. For a trading approach a broader range of institutions need to be set up and technical preparations (such as registry, baseline and cap definition) to be considered. Here, ETS experience would be helpful and should be gained. In terms of the technical capabilities and capacities of human resources, the NMM is probably more demanding for host countries, whereas NAMAs allow for more freedom once their structure is defined, operationalized and actually implemented. An interesting aspect regarding JI was mentioned during the interviews:

9 UNFCCC (2011): COP 17 adopted modalities and guidelines for international consultation and analysis (decision 2/CP.17, paragraphs 54-62 and annex IV of decision 2/CP.17), see http://unfccc.int/documentation/documents/advanced_search/items/3594.php?rec=j&preref=600006772#beg

10 National entities are to be determined who administer the REDD+ activities and a national MRV system. A technical annex of the BURs of countries engaging in REDD+ will provide detailed information on REDD+ activities. Proposed baselines (“reference levels”) will be assessed by a technical team of two LULUCF experts, one each from a developing and an industrialized country. Baselines can be modified on the basis of the assessment.

"I also think we need to look at Joint Implementation (JI); JI is not relevant as a market mechanism anymore but as a design [...]. NMM and FVA are kind of like JI track 1 and 2, NMM is track 1 and FVA track 2, which has allowed you, depending on national capacity; you can do things outside of UNFCCC rules. Of course it should be arranged differently, because JI reform towards one track shows that it is not supportable. This is a huge responsibility for governments, so we also need to build mechanisms to [support] their capacity. JI shows that if you don't trust the capacity of a country, you don't trust the mechanism, and you cannot use the respective mechanisms in a useful way. It is about national capacity both in NMM and FVA." (Interview No.5)

Technical dimensions

(4) Data requirements: Both sectoral crediting and trading require robust data. The difficulty here is projecting economic growth or the impact of policies on emission levels. For baseline and BAU definition solid historic data is needed, also depending on whether a target type referring to a base year, a BAU deviation or an emissions intensity target are chosen. This question was highlighted by many interviewees as relevant:

"Data availability is a major challenge. And here it does not so much depend on the country – really solid and robust data is difficult to obtain everywhere, if it was just not monitored thoroughly enough in the past" (Interview 7).

Then it is also difficult to determine what an ambitious reduction is, i.e. what emissions reductions are beyond an ambitious baseline and can therefore be credited. This relates again to proper MRV design, where one interviewee brought it to the point:

"[...] MRV needs to start from the baseline setting exercise itself. Measuring the emissions reductions later, that is easy, since you have measurement equipment etc. and it is something that you can observe and measure. But verifying a baseline where you just have projections and no actual data, is much more difficult. So you need very clear guidelines and you need guidelines that tell you how to make a sensitivity analysis, and how to demonstrate what would happen under different possible future scenarios. Thus you should not build just one BAU scenario, but several ones, considering for instance what happens if there is another financial crisis. Besides, the methodology should be unified and transparent and as standardized as possible" (Interview No.1).

This aspect of required guidance is a key point underscoring again that crediting and trading would be best accommodated under the NMM.

Standardization is an important aspect here, so allowing for standardized sampling approaches (also from other countries) could be an opportunity to overcome data problems. Under a trading approach robust data is particularly relevant for defining the baseline scenario and the cap. In case historic data is not available, which represents a major barrier to the implementation of a trading approach, the integrity of the approach is at risk.

(5) MRV infrastructure and processes: Both crediting and trading demand robust and central MRV provisions, which would ideally be rule based with common accounting standards. Thus, the required infrastructure and rule set for MRV of crediting and trading mechanisms will most likely be defined internationally. However it still needs to be implemented and enforced by national governments, which requires a robust domestic approach as well involving the infrastructure and processes to maintain registries, inventories, and undertake regular monitoring. The NMM will certainly define in its modalities and procedures how MRV processes are to function on the international level, as well as the broad strokes regarding the roles of national governments. The International Consultation and Analysis (ICA) process already sketches MRV relevant aspects, which already today apply to NAMAs. The level of MRV requirements for proper crediting and trading mechanisms also point towards NMM as the appropriate venue for negotiating and implementing such mechanisms.

(6) Prevention of double counting: For preventing double counting any domestic mitigation action needs to be registered and traced. The credibility of an international emissions trading market amongst governments strongly depends on the credibility of the commodity, i.e. credits or allowances. Hence, an international registry needs to reflect

for such issues (such as the International Transaction Log under the Kyoto Protocol). Also a domestic registry should be in place registering all domestic action and contain information on existing policies pertinent to the areas of domestic actions for the proper demonstration of additionality. Reporting on the content of such a registry on domestic action would ideally be included in the context of the national GHG inventory, the national communications to the UNFCCC and the biannual update reports. Auditors should check the registry and ensure that no domestic measures or policies are counted twice. For a trading approach similar accounting and registry standards in all participating countries are required. In case robust modalities and procedures are put forward for crediting and trading, those are most likely to address such requirements.

“Double counting is very important and very complicated – there are many definitions of double counting, with the probably most important one being double claiming as per the OECD definition. Here both buyer and seller country claim the emissions towards their targets. You would need to address all these double counting issues, and once other market mechanisms emerge such as the JCM does, it gets even more complicated to ensure that there is no double counting.” (Interview No.8)

(7) Eligibility (additionality): The eligibility of measures depends on the rule set of the mechanism. So far NAMAs do not foresee covering market based approaches, while the NMM is a market approach per se. Thus, crediting and trading would inherently fit under the NMM. The additionality – and with this also the environmental integrity of any approach – strongly relates to the robustness of baseline setting, and scope of the approach. For crediting additionality can be defined as activities beyond the ambitious baseline that covers existing and future domestic action. Here also “standardized aspects and positive lists can play a stronger role” (Interview No. 7). An important aspect for trading approach is the supplementarity rule to ensure that sector target is not exclusively the result of domestic or international offsetting only.

(8) Transaction costs: Regarding the transaction costs for both crediting and trading the equation reads “the more stringent the MRV, the higher the transaction costs”. Both approaches require technical and personal capacities within the host country and on the international level, but as trading has a mandatory component, the government would even more engage technical MRV processes in ensuring compliance, and thus drive up the costs. The integration of CDM elements can help reducing transaction costs, in particular the application of standardized processes. Here one faces a trade-off between standardization and integrity.

“On a sectoral level still one would have individual activities that have to be designed, monitored and verified. This would not significantly reduce transaction costs” (Interview 7).

An opportunity for further reducing transaction costs would be to do the MRV based on sector inventories (here one would face an even larger trade-off). We assume that the NMM modalities and procedures will require many technical and institutional aspects that we discuss here for crediting and trading - thus accommodating crediting and trading under the NMM allows for utilizing synergy effects. For NAMAs a crediting approach could build upon CDM elements (such as standardization).

(9) Incentive structure: Under crediting the financial incentives for governments are provided ex-ante. When translating action towards the domestic level it depends on the government whether it utilizes credits as carrots for incentivizing action or applies other sticks for enforcement of action. Under trading allowances are allocated ex post, and could potentially be traded on an international carbon market. While the government needs to enforce action on the domestic level, it could closely monitor the success of the domestic measures, and eventually decide whether to buy or sell allowances. Both aspects would need to provide incentives and prevent free-riding on the domestic level.

Under the NMM (crediting/trading) as well as under NAMAs (crediting) incentives for domestic action have to be forwarded by the government to the emitters.

(10) Net avoidance effects: By setting up an ambitious baseline and crediting only reductions beyond this baseline the host country provides own contributions under a crediting scheme. Under the trading route net emission reduction would occur if the baseline is determined conservatively but not inflated, and if the cap is set ambitious. Both aspects refer to robust baseline setting, see above. Net avoidance is a key requirement of the NMM, while NAMAs without trading component per se generate net reductions (if designed properly). If crediting of NAMAs would need to demonstrate net emission reductions, baseline setting would need to be robust and transparent.

Political dimensions

(11) Scope of mechanism/measure: The scope of the mechanism depends on characteristics of the sector (nature of emission sources) and technical aspects such as MRV approach, baselines, but also on the existing policies within the country. Here, trading is better suited for large point emission sources such as heavy industry or power sector, while crediting is can also cover smaller and dispersed measures and is attractive for sectors that are not already fully regulated in terms of mitigation policies and measures, and that have a certain reduction potential to address "high hanging fruits".

"Depending on the MRV one may target different sectors. If the MRV is done in a facility by facility approach such as under the CDM, and one aggregates projects to a sectoral level, then one probably focuses on sectors that are already successful under project based CDM, such as industry, cement, power generation. Distributed generation would also be a possibility under that regime through PoAs. If instead a sectoral MRV system based on statistical data is applied, one could target the transport sector for instance. The key question is how emissions are monitored, on an individual basis or on a group basis. Regarding countries the CDM has shown that in countries with low capacity one should not go for sector wide mechanism with sector wide monitoring etc. Rather individual or project based MRV with individual verification, so a CDM or VCS (Verified Carbon Standard) based approach. Countries with enhanced capacity such as Colombia, Mexico have the potential to go forward to inventory based MRV for sectors where individual monitoring is prohibitive such as in the transport sector. Though, I am biased against too much making use of inventories as a trade-off exists between environmental integrity of reductions and level of transaction costs" (Interview No. 3).

(12) Timeline to implementation: As data requirements are quite significant probably 2-3 years lead time seem reasonable – this would speak for the NMM (that is not to be operational within the next 5 years anyways).

(13) Political feasibility: An important issue with regards to political feasibility will be transparency and accountability, i.e. demonstration of environmental integrity (in particular if default approaches come into play). The main difference is that under a STM governments will push harder for reaching the cap, and thus enforce mitigation action on the sectoral level. This could alert lobby groups for working against too stringent caps. Thus, the feasibility of crediting and trading to be implemented depends on the domestic circumstances and even more on the national governments ability to enforce action. Here the incentivizing character carbon trading could support the government, which is more likely under the NMM.

Brief summary and assessment

Crediting and trading approaches are mainly thought for application with broad scopes/segments, and thus are designed for a sectoral mechanism. The EU proposals for SCM and STM underscore this fact. The requirements for regulatory and administrative actors are significant on the international supervisory level, as well as at the government level. Installations are most likely not influenced, apart from experiencing domes-

tic policies and instruments that were incentivized by the crediting approach – unless governments would directly transfer credit incentives.

In terms of data requirements sectoral crediting, and trading even more, demand high quality of data for projections. As the current reporting provisions under ICA and within the BURs still need to demonstrate their robustness, it appears more likely that crediting and trading would be better suited under a central mechanism with clear rules such as the NMM. Crediting of policies in theory could be accommodated under a credited NAMA, if that concept ever materializes, but again here the current MRV provisions for NAMAs look too loose for generating credible units.

“Apart from markets, envisaging sectoral emission reductions makes sense. NAMAs could be a better vehicle for accommodating sectoral initiatives, though credited NAMAs would again start making things complicated.” (Interview No. 3)

5.2.4 Developing sectoral approaches based on domestic policy instruments

After having discussed elements of the CDM (i.e. SB and PoA) and the concepts of crediting and trading, we subsequently focus on a broader range of measures that are driven and implemented domestically and/or have a non-market character. A lot of action under future mechanisms and NAMAs is to be implemented by national governments on the domestic level, and there is a broad range of possible measures with GHG reduction benefits. We categorize them as financial and regulatory measures:

Table 6: Domestic policy measures with sectoral character

Category	Measure / Instrument
Financial	Carbon fund
Financial	Tax incentives
Financial	Soft loans
Financial	Subsidies
Financial / Regulatory	Carbon tax
Regulatory	Feed in Tariffs (FiT)
Regulatory	Energy Efficiency / RE certificates
Regulatory	Energy Efficiency & Industry Standards

Source: authors

A key distinction between conventional project-based approaches and emerging sectoral approaches is the requirement to initiate or achieve transformative effects in the respective sector. However, these initiatives are not organized under a coherent mechanism or

other umbrella. Table 6 provides a brief impression of the diversity of measures, which is in practice even much broader, and can in theory be open to any initiative or sector, without a concise set of requirements on UNFCCC level. This makes a comprehensive analysis of these policy instruments along the set of indicators difficult. Further research could assess individual NAMA or NMA instruments in more depth. Yet, as the focus of this study is on market-based approaches, we conduct our subsequent analysis in a more generic way along the three dimensions “institutional”, “technical” and “political”.

Political dimension

The scope of approaches will be defined by the measure / mechanism itself - specific policies and measures focus on certain areas or sectors, such as FiTs (energy). The time for implementing domestic measures depends on the national policy environment and the ability of the government to enforce action. However, complex policy instruments require robust preparation if they shall work effectively, which is likely to take several years. Once operational, the current conceptual vagueness allows that a domestic measure can relatively easy structured as a NAMA, while the NMM is still an embryonic mechanism and thus will only be operational in a few years' time, at the earliest. Investment certainty here refers to stability of international revenue streams supporting an action. This depends on the bilateral negotiations of donor and host country/emitter, on the policy design and the government's credibility. If international finance under a supported NAMA is provided, it becomes important how this money is channelled through towards recipients, e.g. via green loans or grants. The political feasibility of measures is determined by the measure itself, and again the domestic policy landscape. Here, the interests of the respective stakeholder groups involved are relevant - national initiatives require national support, but are likely to face opposition from various lobbies (e.g. fuel industry or coal power lobbies).

Institutional dimension

The administrative requirements strongly depend on the nature of the action. One could assume that an overarching set of international rules is introduced for governing individual action, e.g. under the UNFCCC. The national government has the key responsibilities for domestic measures, and thus is required to enable the respective authorities / administrative bodies. Third party auditing could become relevant if required by national legislation, or of international provisions of the UNFCCC or donors under a supported NAMA. Internationally capacity for an oversight body may be required once a global rule set is in place (in the way the FVA is desired by some parties), while for the domestic level full capacities for setting up measures are required, including administrator at government level (e.g. unit in ministry), registry and processing units (such as DEHSt), as well as expertise for defining baselines and targets.

Technical dimension

The credibility of any measure with GHG reduction benefits hinges on robust BAU scenarios, baselines and MRV - otherwise no sound accountability is possible. Hence, data requirements are high, though may vary from measure to measure. For defining GHG reductions, one needs robust emissions data (historic and BAU) of the respective national sector. Depending on the sector and country, an inventory-based approach may help. The structure of MRV strongly depends on the measures at stake, but for all national policies and measures domestic requirements may be introduced. In case a NAMA approach is chosen, the UNFCCC MRV requirements (see ICA and BUR) come into play.

Regarding the prevention of double counting domestic measures with GHG reduction benefits generally need to be registered for a government being able to claim reductions. Here, a national registry may need to be put in place and register all domestic action (should also hold existing policies to ensure that additionality could be demonstrated). Reporting of registry (i.e. part of inventories, national communications or BUR) could be made mandatory. Auditors should check the registry to ensure that no domestic measures/policies are counted double. The eligibility and additionality again is defined by national legislation. Domestic action faces eligibility constraints defined by national legislation (if any), but needs to comply with international provisions if they shall be accommodated under an international mechanism (such as the NMM asking for additional and measurable reductions). International guidance for defining additionality of policies and measures could be helpful, for ensuring comparability of reductions and substantiating integrity. The transaction costs are determined by the individual measure at stake - building upon existing schemes such as the CDM can help with reducing initial costs (e.g. for developing new methodologies). Incentives from the international level could be provided ex-post (in any RBF scheme). Ex-ante provision of finance could work in a supported NAMA setting where green loans or conditional loans are provided. Otherwise, domestic approaches for setting incentives need to be set up by the government (either introducing compulsory policies, or incentivizing action with “carrots”). In case domestic measures are additional, they directly contribute to net emission reductions (if no trading is involved). Co-existence of mechanisms / approaches / instruments is possible as long as no double counting occurs. Ideally mechanisms / approaches are also reflected in a registry.

Brief summary and assessment

Domestic measures are to be regulated and designed on the national level, by the national governments, and may work under the NMM or FVA in future, if the respective modalities allow for them. Compared to NAMAs, stricter international provisions from a centralized mechanism such as the NMM are likely to increase the environmental integrity (including net emission reductions). However, the NMM (and even more the FVA) do not exist yet. Today, any domestic policy measure can be labelled as NAMA, as long as it complies with the rather loose UNFCCC (MRV) provisions, although the lack of incentives for private sector investment (e.g. through crediting approaches and the insufficient levels of (public) international climate finance) have so far prevented a stronger uptake of NAMAs. Overall, the range of approaches sketched above in the first place seems to qualify for NAMAs, but could also be developed as an RBF scheme (which does not prevent labelling it a NAMA, though). Once the picture on future mechanisms on the international level becomes more diversified, the role of domestic policy measures under the future climate policy regime will become clearer, and should be studied and analysed further. Until then they can be best accommodated under NAMAs.

5.3 Summarizing opportunities for sectoral approaches under NMM and NAMA

The key findings of the analysis in section 5.2 will be briefly summarized in the tables below in order to concisely convey the key messages and results in a more reader friendly format. Table 7 draws attention to SB and PoA CDM elements with SB. Table 8 consolidates the findings on sectoral crediting and trading.

Table 7: Overview of options for further evolution of sectoral approaches based on the CDM

		Sectoral Elements and Mechanisms	
Institutional	Administrative requirements	SB	PoA
		UNFCCC: <ul style="list-style-type: none"> - CDM support structure to check QA/QC of proposed SBs, recommend approval or rejection to EB, make information available - Support for DNAs and PPs (helpdesk, RCC) - CDM project cycle and methodologies - Specific SB guidance and procedures Host country: <ul style="list-style-type: none"> - DNA to ensure quality and maintenance according to QA/QC principles (completeness etc), - LoA - Submission of SBs 	UNFCCC <ul style="list-style-type: none"> - Based on CMP Mandate, EB develops guidance and procedures - Support for DNAs and PPs (helpdesk, RCC) - CDM project cycle and methodologies - Specific PoA guidance and procedures Host countries: <ul style="list-style-type: none"> - LoA Market participants: <ul style="list-style-type: none"> - CDM project cycle and methodologies, CME/CPA coordination
	Regulatory requirements	UNFCCC: <ul style="list-style-type: none"> - CMP exercises political oversight, establishes priority sectors according to political objectives (geographical distribution) and development of relevant guidance - EB has authority to approve SBs (drawing on CDM support structure and project cycle), - EB can initiate top-down suspension, modification de- 	UNFCCC: <ul style="list-style-type: none"> - CMP has mandated the introduction of PoA, development of guidance and procedures - EB has authority to approve PoAs, drawing on CDM support structure and project cycle Host country:

		<p>development</p> <p>Host country:</p> <ul style="list-style-type: none"> - new role for DNA: LoA, but also SB QA/QC procedures, responsibility for submission, and update 	<ul style="list-style-type: none"> - LoAs, - sector-specific regulation (not CDM specific)
	Role of third-party auditors	<p>Similar to conventional DOE role:</p> <ul style="list-style-type: none"> - Assessment Report of proposed SB (similar to validation), can be waived for LDCs - Established validation and verification for CDM activities using SBs 	<p>Similar to conventional DOE role according CDM project cycle</p> <ul style="list-style-type: none"> - validation only for PoA-DD, not CPA-DD - verification needs to take place simultaneously for all CPAs - specific rules for micro-scale methodologies - Uncertainty of DOE liability has delayed uptake for several years
	Capacity requirements	<ul style="list-style-type: none"> - UNFCCC: similar requirements than for methodology development - DNAs: much higher due to responsibility for quality of SB development, submission and maintenance - Market participants: lower if SB readily available, similar to methodology development if PP develop SB together with DNA 	<ul style="list-style-type: none"> - UNFCCC: similar, although more complex requirements than for processing projects and methodology development - DNAs: similar - Market participants: High, due to complexity of aggregating activities, potentially multiple implementing/executing entities/actors - Higher for CME (potentially public sector for sector-wide approach) - Potentially lower for CPAs
	Data requirements	<ul style="list-style-type: none"> - Based on CDM methodologies or specific SB establishment guidelines - Data needs cover entire sector not only project - Data maintenance for updating SBs may require new competences in DNAs 	<ul style="list-style-type: none"> - Based on CDM methodologies - Depending on level of standardization, high data requirements in particular for MRV of small-scale interventions (e.g. household surveys)
	MRV infrastruc-	<ul style="list-style-type: none"> - Drawing on CDM methodologies - Data updates necessary 	<ul style="list-style-type: none"> - Drawing on CDM methodologies - Higher complexity in particular for sectors that aggregate
Technical			

Structure and processes		<p>many small activities</p> <ul style="list-style-type: none"> - Has led to innovative MRV approaches, e.g. cross-sampling - Some concerns remain (see “third-party auditors”) - UNFCCC CDM registry
Prevention of double counting	<ul style="list-style-type: none"> - No direct relevance, but SBs enhances comparability across countries (contributes to transparency, prevents double claiming) 	
Eligibility	<ul style="list-style-type: none"> - SB use is likely to become mandatory - SBs can optionally include automatic additionality (positive list) 	<ul style="list-style-type: none"> - Additionality tools - Positive lists possible - CME-CPA structure could be transferred to sector-wide participation in NMM
Transaction costs	<ul style="list-style-type: none"> - UNFCCC: Potentially higher in case of top-down SB, similar for bottom-up SB - DNAs: Significantly higher due to upfront methodological work - Market participants: Lower for market participants, as default values are provided 	<ul style="list-style-type: none"> - UNFCCC: Potentially higher in case of top-down SB, similar for bottom-up SB - DNAs: no difference - Market participants: Initially higher transaction cost due to higher complexity, but high potentially lower transaction costs for additional CPA
Incentive structure	<p>Similar to project-based CDM:</p> <ul style="list-style-type: none"> - ex-post, but higher certainty on expected CER yields, as baseline is pre-determined for all activities in entire sector, sometimes even across countries - price dependent on market fluctuations - Compatible with upfront finance such as RBF 	<p>Similar to project-based CDM:</p> <ul style="list-style-type: none"> - Ex-post - CER value dependent on market - Some funds target specifically PoAs rather than projects - Compatible with upfront finance such as RBF
Net avoidance effects	<ul style="list-style-type: none"> - Depends on conservativeness of SBs, can be high, but are intransparent as the mitigation effects of “ambitious baseline” typically is not quantified and visible (as the CDM does not have this mandate) - Resulting CERs can be used as 100% offsets, but can also be cancelled and then act as a receipt for net mitigation 	<ul style="list-style-type: none"> - Depends on conservativeness of methodologies and crediting period. - Resulting CERs can be used as 100% offsets, but can also be cancelled and then act as a receipt for net mitigation action

		tion action	
Political	Scope of mechanism/measure	<ul style="list-style-type: none"> - focuses on priority sectors and - approach transferable to non-CDM sectors, although mandate of regulators limited 	<ul style="list-style-type: none"> - Some restrictions currently apply (exclusion of cement sector), but transfer potential is high
	Timeline to implementation	<ul style="list-style-type: none"> - already operational, but still recent concept with limited uptake primarily in “under-represented” countries 	<ul style="list-style-type: none"> - Already operational, concept has established itself firmly, wide implementation across regions, sectors and scales
	Political feasibility	<ul style="list-style-type: none"> - high degree of acceptance, cornerstone of CDM reform efforts, but practically restricted to LDCs (due to market situation), no uptake in middle and high income developing countries 	<ul style="list-style-type: none"> - High degree of acceptance, large-scale uses across all relevant CDM countries. Uptake impacted by post-2012 uncertainty similar to CDM projects
	General relevance for sectoral approaches	<ul style="list-style-type: none"> - Sector-orientation: Established based on performance of (sub)sectors, not projects - Key approach to improve and extend the CDM’s methodological “toolbox” (baselines, additionality, MRV) - Key aspect of UNFCCC CDM reform debate due to simplification, comparability and transfer potential - Key challenges are capacity requirements and upfront transaction costs by either UNFCCC and/or host countries, and donor countries - CDM SBs target sectors that have not been penetrated by the CDM previously (transport, forestry, agriculture, potentially others such as building efficiency) - Already operational, but uncertain role beyond Kyoto Protocol (KP) CP2 	<ul style="list-style-type: none"> - Step towards sector-wide approaches due to aggregation of mitigation activities (see table 1) - Applies to large, small and micro-scale activities - Experience on roles of CMEs, CPA, and their interactions - Ongoing consolidation of standards and procedures has already yielded important lessons e.g. for MRV design - Has shown role of unexpected difficulties of operationalizing more complex approaches at higher scales (DOE liability) - Accuracy of accounting very high, potentially less need for stringency if there is no international trading or high degree of net mitigation - Vulnerable to market uncertainty
	Specific to NMM / FVA	<ul style="list-style-type: none"> - SBs typically operate on higher level of aggregation than projects: potentially, a higher level of conservativeness may achieve higher level of net mitigation, although this is not made visible (as this is not the mandate of the 	<ul style="list-style-type: none"> - Experience with aggregation - CME and CPA roles, although this will need to be adjusted according to the different role of the host country government - Further potential lessons depending on design of the

		CDM) - Can be used for crediting entire sectors - Could function as benchmark for FVA approaches - Further potential lessons depending on design of the NMM/FVA	NMM/FVA
	NAMA	- high applicability as a methodological/conceptual approach for establishing both baselines, eligibility and MRV, e.g. for results-based financing or other approaches - As NAMAs currently do not generate offset credits, net mitigation impact is 100%	- High applicability for aggregated activities (e.g. CME-CPA relationship, MRV) - If CER cancellation becomes more important, this PoAs could be transitioned into a variety of credited NAMAs which do not generate offsets (as CERs are cancelled)

Table 8: Overview of options for further evolution of sectoral approaches crediting/trading, regulatory and non-market measures

	Indicators	Sectoral Elements and Mechanisms	
		Crediting and trading approach	Domestic Policy Instruments
Institutional	Administrative requirements	- The UNFCCC (COP/MOP) functions most likely as supervising Mechanism, approving modalities and procedures; - CDM bodies are not involved for crediting in the first place, but its structure could be utilized (e.g. EB, Meth Panel, working groups, accreditation aspects for third party auditors etc.). - The national government has way more importance compared to CDM; - Also here the national government becomes important for defining and enforcing the domestic action. - Sectoral bodies could also play a role, but probably have no enforcement power (national building council etc).	- The administrative requirements strongly depend on the nature of action. In general one could assume that an overarching set of international rules is introduced for governing individual action, e.g. under the UNFCCC.

		<ul style="list-style-type: none"> - Also sectoral trading is intended to work under a centralized mechanism, with a clear set of rules determining the process. 	
	Regulatory requirements	<ul style="list-style-type: none"> - The UNFCCC is envisaged to supervise and put forward a certain set of rules; - Host country governments play key role by defining domestic approach - need to define sectoral policy or measure. 	<ul style="list-style-type: none"> - As above, international rule set may be required, while national legislation is a prerequisite.
	Role of auditors	<ul style="list-style-type: none"> - As credits shall certify emission reductions independent third party auditing would most likely be required. 	<ul style="list-style-type: none"> - Could become relevant in case i) the national legislation requires for it, or ii) if international provisions of donors under a supported NAMA request it.
	Capacity requirements	<ul style="list-style-type: none"> - Internationally capacity for an oversight body is required, while for domestic level full capacities for setting up crediting approach are required. 	<ul style="list-style-type: none"> - Internationally capacity for an oversight body may be required in case a global rule set is in place (in the way the FVA is desired by some parties), while for the domestic level full capacities for setting up measures are required.
Technical	Data requirements	<ul style="list-style-type: none"> - Key element for baseline and BAU definition - solid historic data is required, for base year target approaches, while BAU deviation or intensity targets are picked, less historical data required (but modelling). - An important question is how to determine what is ambitious reduction, i.e. what is beyond an ambitious baseline and will be credited? 	<ul style="list-style-type: none"> - Data requirements are per se high, though may depend on the measure applied.
	MRV	<ul style="list-style-type: none"> - Monitoring of emissions performance at sector level is required, though potentially sampling is feasible. As crediting is involved auditing may be required (could be national auditors if they are accredited at UNFCCC). - MRV is ideally rule based, robust and central, but at the discretion of host country. - Data and Information on existing PAMs are required. 	<ul style="list-style-type: none"> - The structure of MRV strongly depends on the measures at stake - for all national policies and measures domestic requirements may be introduced. - In case a NAMA approach is chosen, the UNFCCC MRV requirements (see ICA and BUR) come into play.

Prevention of double counting	<ul style="list-style-type: none"> - National registry must be in place and register all domestic action (should also hold existing policies to ensure that additionality could be demonstrated). - Reporting of registry (=part of inventory/National Communication/BUR) should be mandatory. - Auditors should check registry as well to ensure that no domestic measures/policies are counted double. 	<ul style="list-style-type: none"> - In general, domestic measures with GHG reduction benefits need to be registered for a government being able to claim reductions. - A national registry should be in place and register all domestic action (should also hold existing policies to ensure that additionality could be demonstrated).
Eligibility (additionality)	<ul style="list-style-type: none"> - In the first place a specific size in terms of installations or reduction potential is required (i.e. sectoral characteristics). Then one would need to ensure that no free riding is possible. - Additionality can be defined as activities beyond the ambitious baseline (that covers [existing] & future domestic action). 	<ul style="list-style-type: none"> - Eligibility depends on the national legislation, and if applicable, on the international rules. International guidance for defining additionality of policies and measures could be helpful, for ensuring comparability of reductions and substantiating integrity.
Transaction costs	<ul style="list-style-type: none"> - Tradeoff between standardization and integrity. - Building upon CDM elements can help. 	<ul style="list-style-type: none"> - The transaction costs strongly depend on the measure - building upon existing schemes such as the CDM can help for reducing initial costs (e.g. for developing new methodologies).
Incentive Structure	<ul style="list-style-type: none"> - Financial incentives for the government are to be provided ex-ante (trading) or ex-post (crediting). - Under crediting it depends on government whether it utilizes credits as carrots for incentivizing action or applies other sticks for enforcement of action. 	<ul style="list-style-type: none"> - Incentives from the international level could be provided ex-post (in any RBF scheme). - Ex-ante provision of finance could work in a supported NAMA setting where green loans or conditional loans are provided. - Investment certainty refers to stability of international revenue streams supporting an action. This depends on the bilateral negotiations of donor and host country/emitter.
Net Avoidance effects	<ul style="list-style-type: none"> - By setting up an ambitious baseline and crediting only reductions beyond this baseline the host country provides own contributions. - Discounting could turn out to be the more robust option for crediting approaches. 	<ul style="list-style-type: none"> - In case domestic measures are additional, they directly contribute to net emission reductions (if no trading is involved).

Political	Scope of mechanism/measure	<ul style="list-style-type: none"> - Attractive for sectors that are not already fully regulated in terms of mitigation policies and measures. - Depends on country, but a certain reduction potential should be there to address "high hanging fruits". 	<ul style="list-style-type: none"> - This will be defined by the measure / mechanism itself, as specific policies and measures can focus on certain areas or sectors.
	Timeline to implementation	<ul style="list-style-type: none"> - As data requirements are quite significant probably 2-3 years lead time, hence only possible as pilot for crediting under NMM after 2020. 	<ul style="list-style-type: none"> - The implementation of domestic measures depends on the national circumstances. Important policy instruments require robust preparation if they shall work effectively, hence a few years of preparation and testing are required. - Once operational a domestic measure can relatively easy be accommodated under a NAMA, while the NMM is still an embryonic subject and thus per se will only be in place in about a decade.
	Political Feasibility (host country position towards MMs, lobby groups, UNFCCC group associations?)	<ul style="list-style-type: none"> - Big issue will be transparency, accountability = environmental integrity (in particular if default approaches come into play). 	<ul style="list-style-type: none"> - The political feasibility of measures depends on the character of the measure, and on the interests of the respective stakeholder groups involved. National initiatives require national support - and are likely to see opposition from lobbies.
	General relevance	<ul style="list-style-type: none"> - Crediting and trading are mainly thought for application with broad scopes/segments, and thus is designed for a sectoral mechanism. 	<ul style="list-style-type: none"> - Domestic measures are to be regulated and designed on the national level, by the national governments, and may work under the NMM or FVA in future, if the respective modalities allow for them.

NMM / FVA	<ul style="list-style-type: none"> - Both trading and crediting are envisaged to work under a central top down mechanism, hence they suit good with the NMM. 	<ul style="list-style-type: none"> - Compared to NAMAs, stricter international provisions from a centralized mechanism such as the NMM are likely to increase the environmental integrity (including net emission reductions). Though, the NMM (and even more the FVA) do not exist yet.
NAMA	<ul style="list-style-type: none"> - NAMAs could be developed into the direction of "credited NAMAs", - here sectoral crediting is essentially policy crediting. Trading is too much of a market based approach as if it would fit under a NAMA. 	<ul style="list-style-type: none"> - Today, any domestic policy measure can be labelled as NAMA, as long as it complies with the rather loose (MRV) provisions for NAMAs.

6 Measures for implementation and evolution of sectoral approaches

Chapter six builds on the analysis and results of the previous chapters and identifies challenges for implementing sectoral approaches (6.1.) as well as potential ways to overcome them (6.2). As there are many common challenges for the various sectoral approaches we have analyzed (SBs, PoAs, sectoral crediting and trading, as well as domestic policy measures with sectoral character), we do not consider these individually below, but refer to common barriers and solutions. Instead, we focus on three key stakeholder groups: the UNFCCC, national host country governments, and market participants / investors, which have to adopt new roles in the implementation of evolving sectoral approaches. However, we highlight if specific barriers or solutions are particularly salient in the context of one of the specific sectoral approaches.

6.1 Identifying challenges for implementing sectoral approaches

The previous chapters have taken stock and evaluated the progress of various sectoral approaches for UNFCCC mechanisms, as well as options for their potential further evolution. This chapter consolidates and scrutinizes these options by asking for the challenges that could stand in the way of realizing this potential. In order to develop a practice-oriented and policy-relevant approach, we differentiate between three main stakeholder groups: First, the UNFCCC negotiations process and governance architecture is the institutional and political core of the international climate regime. Therefore, we begin by discussing possible challenges at the global level that could be faced by the UNFCCC process and relevant UNFCCC bodies and actors. Second, national governments act as negotiators in the intergovernmental UNFCCC process and therefore have influence on shaping the evolution of sectoral approaches on a political level. In addition, governments are key drivers for promoting the domestic implementation in particular of existing, but also of possible pilot activities for emerging mechanisms. A number of national governments are already participating in the PMR, an even greater number has already submitted NAMAs or is currently preparing them. As the previous chapters have explained in depth, sectoral approaches also have potentially much greater impacts on national development than a project-based approach. Therefore, the roles of host country governments will fundamentally change compared to the original CDM requirements. Depending on the type of approach, government roles can be expected to range somewhere between conducting QA/QC procedures for SB development and full-fledged market facilitation and oversight functions similar to hosting an ETS. Market participants are in the first place actors that implement mitigation action (such as emitters and/or their service providers), that generate carbon credits or other outputs (such as electricity) from implementing mitigation activities, but also investors and buyers of carbon permits. The CDM was designed with an explicit bottom-up design, which allowed market participants to develop activities on their own initiative within a global framework and project cycle, but only a very limited supervisory role of national governments. This applies at least to the DNA functions, as of course any economic activity is embedded in sector-specific regulation and (sometimes informal) practices that exist independently of the UNFCCC process, and have a key impact on the domestic success of a mitigation activity. Furthermore, the CDM pipeline shows very clearly that private investment both in CDM projects and PoAs has essentially dried up due to a lack of demand and CER price volatility and depression. This applies to any new market mechan-

ism (Michaelowa 2012), and it is critical to be conscious of the need for a sufficient level of certainty on return as a precondition for private sector investment, in particular in countries with difficult investment climates. However, the evolution of sectoral approaches and the increasing interactions with climate finance instruments offer potential ways to address these issues, as the experience with an increasing number of ETS around the world shows, in which floor prices, market stability reserves, and other price volatility control measures are emerging and maturing.

In practice, these stakeholders are not isolated groups but engage in interactive constellations, in which sometimes the same people have simultaneous mandates, e.g. a formal role in the CDM Executive Board, being a negotiator for a national government, as well as perhaps even responsibilities for national carbon purchasing programmes (Annex I countries), or promotional activities (non-Annex I countries). Still, we attempt to distinguish these connections for analytical reasons while taking into account potential overlaps. In this setting, we apply the lessons of the previous sections to the stakeholder groups described above, in order to identify critical challenges for the evolution of sectoral approaches within CDM+, NMM/FVA and NAMAs. These challenges are structured assigned to seven broader issue areas, and assigned subsequent numbers in order to facilitate establishing linkages and cross-references between chapters.

6.1.1 UNFCCC

Key challenges for UNFCCC actors include:

1 Common Rules and Standards:

There is still an absence of even the most fundamental rules on role of the UNFCCC, which leads to a high degree of political uncertainty. Still embryonic “early design principles” suggest that the NMM is likely to emerge as a more “centralized” mechanism, i.e. operating under guidance and authority of COP. Yet, the increasing relevance of climate finance (including through NAMAs), and other approaches that could become relevant within the FVA, or even outside of the UNFCCC strongly suggest a considerable degree of fragmentation, that creates a broad range of challenges.

1.1 Finding agreement on the degree of centralization

Regulatory authority: different sectoral approaches will require different arrangements for the COP to exercise its authority and guidance. It is not clear, which regulatory bodies will emerge in the future climate policy regime and how they could influence or administrate sectoral approaches. For CDM based approaches such as PoA and SB the existing architecture (CMP, EB, DNA) is likely to continue to play an important role. For the NMM, it seems likely that a multilateral body that is accountable to the COP will be established, although this is not yet clear at this time: Will there be a new designated global regulatory body similar to CDM EB - or the EB itself with an adjusted mandate established by a COP decision? What are its competences and responsibilities? This relates to the balance between global and national levels: Which competences can remain on the global level, and which need to be transferred to host country governments? For crediting and trading approaches, as well as domestic policies, the national government has the key responsibilities for implementation. Sectoral trading represents the strongest deviation from the baseline and credit approach, and the transfer of regulatory authority to host countries is most different, as similar provisions than for inter-

national emission trading would be required (see also section 6.1.2.). PoA elements such as the function of a CME can be transferred but will require adjustments and are likely to be operated by public sector actors which raises new questions and challenges on the host country level.

1.2. Negotiating net mitigation and “own contribution”

Politicization of technical concepts: Deriving net mitigation effects is challenging if tradable units are involved, while pure domestic measures represent net GHG reductions per se – as long as they are additional. Double counting and environmental integrity (MRV and additionality) are the most relevant aspects in this regard. Applying ambitious standardized baselines for defining the amount of tradable units, discounting of credits or even CER cancellation requires a transparent and robust technical foundation, which is ideally to be defined internationally.

“Net mitigation is not a scientific approach, you can do “undercrediting”, and therefore do more than a conventional approach.” (Interview No. 6)

“An important thing with offsetting is that there is no “own contribution” of mitigation envisaged. So if you want to derive net mitigation in an offset based mechanism, you would need to discount credits. Thus, one needs to distinct net mitigation and own contributions. You can do that within a project based scheme (e.g. by discounting or ambitious baselines). For example, the latest HFC 23 methodology under the CDM is exactly that. Within that methodology a threshold for crediting is set at a level that no plant in the world has ever reached – so the current version of the methodology only issues credits for a small part of the covered emission savings, and thus in fact provides a net mitigation benefit.” (Interview No. 3)

Those approaches are however politicized because of perceived imposition of mitigation commitments and loss of revenue. This has prevented progress on technical issues, and therefore negatively impacted progress on sectoral approaches, particularly in the negotiations on NMM/FVA. Still, PoA and SBs continue to mature, and work on conservative standardization may continue to drive net mitigation. A technically easy solution would be to account for “own contribution” through CER cancellation, which has become a prominent issue in the ADP. However, this raises the challenge of generating financing as well as for administrative and eligibility requirements need to be met in order to avoid double-counting.

1.3. Fragmentation and need to integrate UNFCCC-external developments

While the FVA remains vague, bilateral mechanisms established by powerful rich countries establish “facts on the ground” (JCM, WCI) – with a tradeoff between useful pilot experiences¹¹ and a fragmented landscape of mitigation mechanisms which raises the risk of mechanism shopping. In the context of sectoral approaches this development becomes even more relevant, as the emergence of a range of sector-specific mechanisms, partly outside of the UNFCCC process. These are unique mechanisms for subsectors or even individual technologies with highly idiosyncratic characteristics, operating in mul-

¹¹ “With regard to baselines, NMM rules are not yet developed, we don’t have modalities and procedures, what we have is an empty shell, we have a bit of research that was done. In my view, you gain more insights not through academic work, and we need piloting of new approaches to see if they can work.” (Interview No. 6)

tiple countries (such as REDD+¹², destruction of HFC gases¹³, or aviation and shipping¹⁴).

1.4. Safeguarding the environmental integrity of certificates

The environmental integrity of certificates strongly depends on eligible approaches, governance architecture, and potentially the degree of offsetting that is involved, which may differ strongly between NMM and NAMAs. The key challenge here are provisions for ensuring additionality, designing robust MRV concepts, as well as the availability of emissions data and a transparent regime.

“I think the main technical challenge is baselines, because in the end baseline setting is playing with numbers and it is just so easy to play with numbers. So it is just a question of how to define BAU, like a projection from now on until 2020 or 2030. How do you define that convincingly, particularly in developing countries where you really don’t know how much they will grow? There is a high uncertainty of growth projections and I am not talking about emissions or how much cement will be produced. It is playing with large-scale growth and growth is the driver for everything. So if you don’t know how much a country will grow, how can you set a BAU scenario?” (Interview No. 1)

Standardization or inventory based approaches could help overcoming those challenges, although a tradeoff exists regarding the quality of credits. This issue has been a strong concern among all the dominant majority of interviewees:

“The overall concern I have right now under the KP agreement we have a solid accounting framework, there is nothing that points towards having an equally solid accounting framework under the new deal. If we are lucky we get something similar, but I’m pretty sure it’s going to be weaker. In this light it will become difficult for new mechanisms to demonstrate integrity, as it for instance will be tough to avoid double counting” (Interview No. 8).

2 Issuance of certificates

This issue area raises three challenges related to the nature of the certificates, the authority to issue certificates, and what the necessary infrastructure comprises:

2.1. Defining the nature of certificates

The evolving range of carbon market standards over the last decade has demonstrated that a variety of approaches and requirements regarding the nature of certificates exist – depending on the interest of market participants and the purpose of the credits. While Renewable Energy Certificates schemes or some voluntary carbon standards sometimes do not meet demanding environmental aspects, units eligible in compliance markets such as CERs or EUAs often have a higher quality. Thus, any tradable unit requires a clear definition for safeguarding the standards quality and for justification of prices. This is particularly relevant regarding the underlying output: Although numerous dimensions are possible (e.g. electricity generated or saved, or fossil fuel subsidies removed), ideally the certificates would be based on GHG emission reductions. The clear

12 Already quite mature with implementation in voluntary carbon markets, although drifting towards a RBF mechanism without market elements in the UNFCCC arena. Linkages with CDM may potentially include A/R SBs.

13 A new sectoral mechanism could be created relatively simply from a technical perspective, although political will is necessary and direction is unclear. A RBF mechanism could be based to varying degrees directly on CDM methodologies and the project cycle for MRV, a specific window in CER cancellation account (to be created), or a link to GCF for managing financial flows. The challenges include the politics related to institutional linkages to the Montreal Protocol.

14 In discussion as Aviation MBM / International Shipping MBM under ICAO/IMO.

definition of certificates also ensures inter-standard fungibility with other markets, e.g. between SCM credits, the CDM and a domestic ETS.

2.2. Lack of clarity on who has the authority to issue credits, and on what basis

Authorities issuing tradable units must be credible and able to decide and act independently, otherwise market interests may try to influence issuance decisions and thus undermine market credibility. In any case international oversight (through UNFCCC) is strongly preferable, be it in the form of a centralized institution for issuance (as under the CDM), or via checks & balances that scrutinize the issuance process through national government bodies. The CDM has demonstrated that maximum transparency is key in this respect.

2.3. Lack of mitigation mechanism “infrastructure”

For issuing certificates a clear system of actors (auditors, implementers), rules & procedures (MRV, SD benefits, issuance “cycle”), and infrastructure (such as a registry) is essential. Any sectoral approach based on the CDM (SB/PoA) can utilize the CDM infrastructure in this context, while a SCM / STM approach would require an international set of rules, as well as guidance or rules for national implementation. In case additional capacities would be required on the international level, the question is how those would be financed (e.g. through a share of proceeds administrative fee under the NMM).

3 Lack of demand and market oversight

3.1. Lack of mitigation ambition leads to “underdemand”

Annex I countries do not put forward mitigation targets in line with the 2°C target, which would allow for a reliable price finding through supply and demand dynamics. In such “policy driven” markets, certificate prices are entirely contingent on political ambition, therefore currently (and probably over the next decade) leading to depressed carbon prices that do not cover costs of implementing mitigation activities. This applies to all mitigation market mechanisms – existing and future ones. Recent developments show a slight increase in “artificial” demand through procurement programmes of Annex 1 party governments. In addition, RBF based schemes such as the CiDev fund of the World Bank will absorb some credits from the market. However, in the light of the required or of magnitude (i.e. stable long term demand for billions of credits) these attempts are an important but insufficient drop in the ocean that can, however, lend a lifeline to highly desirable activities.

“The main concern right now is demand, a market for offsets or market mechanisms and finance for NAMAs. The problem of demand is not just for market mechanisms but also for NAMAs and we don’t have credited NAMAs so far to create demand for NAMAs. So we really need the market situation to be clear, before we can start to think what to do in the practice.” (Interview No. 1)

Another way to look at this challenge is proposed by one of the interviewees:

“The language focuses very much on separate mechanisms at sectoral scale, but there the terminology can also apply to what kind of tools we need to mobilize mitigation action at a higher level. This is why [...] why we are a bit stuck in the negotiations because we sometimes are not clear about the terminologies and talk about different things. That is why I sometimes don’t talk about market mechanisms anymore, because we are in a world, where is it more about mechanisms not just markets. I think of flexible mechanisms...flexibility is at least as important as the market because it can adjust the mechanism to changing circumstances in the future. Flexibility gives us a way of dealing with this uncertainty.” (Interview No.5)

3.2. There is an “institutional vacuum” for containing certificate price volatility

One important question for a functioning market is what level of market oversight is necessary and sufficient to contain price fluctuations? Today under the UNFCCC no institution has the authority and competences to fulfill such a market stabilization function (the COP is too far from market action; the EB is a regulator that has the mandate to remain “neutral”, the GCF is still a paper tiger). Proposals for carbon reserve banks (submission of Papua New Guinea in 2011) or market stability reserve (such as we see in the recent discussion on EU level for the EU 2030 climate package, or under the NAMA facility) exist, though there seems to be a low degree of political acceptance for the problem, especially among Annex I parties.

In this context, an interviewee referred to the risk of brain drain from the CDM:

“Right now there is very serious danger of collapsing of the infrastructure. The moving out of DNV from the market sends a very alarming signal that the CDM is in fact on its way out. I think the project based CDM as an instrument will be gone; it is a matter of time. The real shame in this market collapse that we will not have a lot to go on in terms of developing new offset type mechanisms, we have CDM, we have VCS and other experiments such as the Californian ETS, but the bulk of the experience we gained from CDM.” (Interview No. 3)

6.1.2 Host countries

The stronger role of the host countries in evolving sectoral approaches may allow addressing country circumstances more flexibly, but also raises new challenges related to governance architecture, related incentive structures as well as certificate issuance.

4 Governing National Implementation

4.1. Balancing global and national responsibilities

Currently, the role of the DNA is not well-defined in the CDM’s modalities and procedures, which is largely due to the initial limitation of DNA responsibilities to approving the contribution of a CDM activity to SD. SBs are already beginning to change this role, and the more comprehensive requirements of emerging mechanisms – which may be closer to hosting an ETS than a CDM activity - makes it likely that the role of the host country government authority needs to be more precisely defined. A key question is which responsibilities need to be transferred to the national level, and which can remain at the global UNFCCC level, as well as the political feasibility.

“Host country level is more important under NMM than under CDM. DNA is a good starting point. It has to be build early, of course there will be new tasks in terms of MRV, methodologies because further tasks will be required” (Interview No.2).

Under PoAs the concept of CMEs has produced mature rules and experience – a sectoral approach could be understood as a further evolution of the PoA concept, depending on interpretation of voluntary sectoral crediting or compulsory sectoral trading. However, this is likely to require public sector agencies to assume the CME role, depending on interpretation of sectoral (crediting) mechanism. Finally, under a SCM/STM approach the role of the government is core, as it is responsible for enforcing mitigation action on the domestic level. Those tasks, responsibilities and required competencies need clear definition for being allocated to the respective level.

4.2. Capacity constraints

Countries with a good understanding of CDM and related procedures in place may be hesitant to be willing to invest (scarce staff time) in a new mechanism, e.g. for founding new responsible units in relevant ministries for dealing with SCM implementation. Parties have reiterated on the opportunities of utilizing CDM elements as much as possible in this regard (but not to re-invent the wheel).

“In our view, whenever we discuss markets we refer to the Kyoto Protocol, and in the light of creating ambition we need to refer to the tools that are already available and that is the CDM, but not create new markets before 2020. The carbon price is very low, and the price will not climb by creating new markets. This will only happen by raising ambition.” (Interview No. 11)

“And for more advanced countries, the CDM already has played its role by creating capacities, awareness and emissions data for setting baselines. So these countries could already make the step to broader mechanisms and the CDM could be upscaled there, at least in the traditional sectors. There could also be a scenario where - in China, India and the advanced countries in Latin America - the CDM is used for specific sectors, like for example households, transport, etc. where there has not been much development so far and start moving towards other types of mechanisms for sectors that are already quite well organized like cement, energy, etc.” (Interview No. 2)

Past experience has shown that lower-income countries have already been overwhelmed by CDM, and the NMM may introduce an even have higher level of complexity for governments.

“There is room for project based approaches for various reasons - one important reason is that the governance requirements for CDM were quite low, and CDM activities were initiated even in countries with very challenging governance circumstances. Project based CDM will have a smaller role in the future, though. At the same time you will have aggregated project based but sectoral crediting on the basis of inventories.” (Interview No. 3)

4.3. Vulnerability to lobbying

In sectors with influential companies (such as ESCOM in South Africa, PLN in Indonesia), or strong lobbies (power sector, transport sector) there is high level of proximity and potentially stickiness. This is a challenge for governments to enforce mitigation action, or put forward robust market rules independently. This can have negative effects on the stringency of mitigation measures or credibility of the market infrastructure.

5 Incentive setting

This challenge addresses the need for incentives for a host country to participate in an international mechanism or for the national government to trigger respective incentives for emitters to implement a sectoral approach. In this respect it is important to regard the distinct levels that mechanisms may address – international and national.

5.1. Is it attractive for a country to participate in sectoral approaches?

A country would participate in an international mechanism if sufficient incentives for doing so are available. Participation here means either creating an enabling environment for domestic actors to apply the mechanism (such as under the CDM, where a DNA and potentially domestic CDM laws are in place), or actively deciding to engage as a party under the mechanism (such as entering international emissions trading with a STM). While the former is relevant for SB and PoAs and retains a limited involvement of the government, the latter requires strong engagement of the government for enforcing mitigation action. Attractiveness thus refers to whether the government perceives the SCM or STM (or NAMA crediting scheme) as credible and economically promising enough, i.e. believes in long term market and price stability and investment security. External effects such as pressing environmental problems (e.g. air pollution in China) can also drive political momentum to embark on a mechanism. The nature of the me-

chanism determines whether domestic stakeholders will lobby against the measures (emission caps under a STM are likely to face much stiffer resistance than SCM approaches). Important design aspects that influence the attractiveness for governments are opportunities to flexibly react to external factors influencing the market, such as the rise and fall of emissions due to economic (in-)activity? The government will also need to consider whether the price signals (= incentives) from the international level shall be transferred to the domestic level, i.e. whether a price shall be put on carbon, and if ex-ante or ex-post.

5.2. How to define, measure and implement net mitigation and “own contribution”

The NMM will require host countries to demonstrate net emission reductions. SCM approaches would require clear provisions for defining additionality on the national level (ideally consistent with international provisions), and transparent registration of mitigation achievements. Technical options for ensuring net reductions are discounting or cancellation of credits, or setting of ambitious baselines (i.e. significantly below BAU). So far SBs do not have the mandate to make net mitigation visible, and while conservativeness is a precondition, it does not need to be accounted for. A STM approach would derive net reductions in case mitigation measures are additional. Also under PoA related measures a robust demonstration of additionality is required – and credits need to be traced in domestic and international registries so that no double counting of reductions would occur.

5.3. Lack of access to finance

In countries with difficult investment climate, CDM activities have been impeded by lack of access to upfront finance, in part due to the lack of acceptance of carbon credits as a financial asset in the mainstream financial sector. Sectoral approaches at larger scales are likely to face the same or bigger problems. The availability of climate finance is a general problem in this context, for instance has most of the work on NAMAs only covered conceptual/preparation stages but stopped before implementation – due to lack of finance. The involvement of private sector money via the carbon market is a potential (and often highlighted) solution, though creating a vital global carbon market that is short of credits is a major challenge in itself (see also above).

5.4. Sustainable development

Future mitigation mechanisms are expected to contribute to sustainable development. However, it remains at the discretion of the host country to define what constitutes sustainable development on the national level. The CDM has demonstrated that this aspect can remain relatively generic and play a minor role in the process, if not triggered sufficiently by international rules. Today NAMAs shall result in co-benefits besides GHG emission reduction, though SD is still not defined coherently. Clear international provisions or recommendations for how and why SD aspects are relevant in the respective sectoral approach could help – an idea could be to ask governments to report on SD effects in a frequent and detailed fashion.

6 Certificate issuance

Certificates can be issued in various ways – allocation according to certain parameters (ex-post based on verified reductions or ex-ante through grandfathering or benchmarking) or via auctions.

6.1. Governance structure for certificate issuance

National governments serve as economic actors in markets and thus have an intrinsic interest to maximize the credit yield, which raises questions about the level of regulatory authority that can be transferred from global to national level. A relevant example is Joint Implementation, where under Track 1 host country governments were able to bilaterally engage in trades of ERUs – this needs to be reflected when designing future mechanisms.

“I also think we need to look at Joint Implementation (JI); JI is not relevant as a market mechanism anymore but as a design [...]. NMM and FVA are kind of like JI track 1 and 2, [...] which has allowed you, depending on national capacity, you can do things outside of UNFCCC rules. Of course it should be arranged differently, because JI reform towards one track shows that it is not supportable. This is a huge responsibility for governments, so we also need to build mechanisms to their capacity. JI shows that if you don't trust the capacity of a country, you don't trust the mechanism, and you can use mechanisms in a useful way. It is about national capacity both in NMM and FVA.” (Interview No.5)

6.2. MRV

The relevance to demonstrate credible emission reductions hinges on the robustness of the MRV regime. The CDM's MRV has evolved to a robust and transparent system, and thus can serve as the foundation for SB or PoA based sectoral approaches. Under SCM or STM the national government is required to implement rules and procedures for the national MRV, and comply with any future MRV provisions.

“But this MRV needs to start from the baseline setting exercise itself. Measuring the emissions reductions later, that's easy, since you have measurement equipment etc. and this is something that you can observe and measure. But verifying a baseline where you just have projections and no actual data, this is much more difficult. So you need very clear guidelines and you need guidelines that tell you how to make a sensitivity analysis, how to show what would happen under different possible future scenarios. Thus you should not build just one BAU scenario, but several ones, considering for instance what happens if there is another financial crisis. Besides, the methodology should be unified and transparent and as standardized as possible.” (Interview No.1)

“It is easiest to start in sectors that are relatively homogenous since it is easier to establish baselines in that kind of sectors. And we also see that there are several sectors in which there are already strong institutions and also private initiatives that are collecting emissions data like for instance the “Cement Sustainability Initiative” or similar initiatives in the aluminum and power sector. So, wherever there is already capacity or a relatively homogenous structure of the sector, mitigation instruments with a sectoral scope could be applied.” (Interview No. 2)

A centrally determined approach from UNFCCC level is probably the most logic approach, however does not find support in with all parties (as many strive to develop bottom up initiatives such as the JCM, e.g. under the FVA). Auditors could play an increasingly important role, and for the NMM they should at least be accredited by international authorities under the guidance of the COP. Again, the followers of bottom up approaches would oppose too strong central governance.

6.3. Need to define “host country liability”

The preceding challenges suggest that there are risks for the integrity of certificates. The operationalization of the PoA concept has revealed the issue of DOE liability, which still needs to be better understood and resolved, as the latest technical paper by the

UNFCCC secretariat paper demonstrates (UNFCCC 2014).¹⁵ The more important role of the host country in future sectoral approaches suggests that there will be a need to define “host country liability” for the case of significant deficiencies in certificate issuance. This risk is particularly relevant if compliance-grade certificates are tradable internationally. Under STM a sanctioning regime is certainly acceptable, while under SCM literature and negotiators still often refer to no loose targets. However, dealing with these issues is likely to be highly politicized, as it potentially challenges the authority of governments to set rules and issue certificates for domestic measures, which is highly likely to be perceived as a challenge to national sovereignty.

6.1.3 Market participants and investors

7 Incentive Structure

As for the host country government, market participants will also experience incentives for engaging in a sectoral approach. While one option is that a government simply introduces compulsory policies (such a firm building efficiency standard for new houses with sanctions for non-compliance, or a domestic ETS in the power sector), another option involves market aspects with trading units. Here, either the government forwards credits or allowances towards the emitters (under SCM or STM), or emitters could engage directly in activities, such as PoAs (e.g. designing CPAs). In this case market participants are going to lobby for maximizing their profits, both in terms of credit volume and value. While this is a legitimate ambition in their role, there need to be sufficient set of checks and balances and a governance structure with high degree of integrity that can balance these trade-offs.

7.1. Credibility of incentives

If a government receives international climate finance support, and forwards those directly to the emitters - how can market participants be sure that sufficient value will reach the market participants, and if that the units are of sufficient quality? This aspects directly relate to the design of mechanisms on the international level, the lack of ambition and demand for credits, and the credibility of the national government (and potentially the openness for lobbying). If no mandatory measures are in place, this can easily lead to freeriding patterns (where not all emitters in the sectoral scope perform mitigation measures due to lacking incentive, and thus undermine the overarching aim of net reducing emissions on the sectoral level). Also the approach needs to be designed in a way that covers all respective sectoral emissions, either via inventory based MRV, or by clearly identifying all emission sources and covering them under the scope of the approach.

7.2. Need for investment certainty

¹⁵ As a side note, one of the suggestions raised in the paper was to create a market stability reserve, which offers interesting links with other aspects of stabilizing price fluctuations and interactions between carbon markets and climate finance.

Market actors (from both public and private sector) may be hesitant to invest if no mid-term investment certainty is signaled by a mechanism - a lesson told by the CDM (Interview response “how many lessons do we need to learn”, Interview No 10). Moreover, higher risk results in higher profit margin expectations by investors.

“[...] The problem is the private sector – why would in a multi-year project an investor build his decision on one or two years of CER revenue streams, that is not sustainable. Although there might be some projects ready and may obtain “funding” through CERs, business people will not go back into that business. One needs a more stable framework, so right now it’s a tough sell for the private sector.” (Interview No. 3)

7.3. Balancing trade-offs between net mitigation and profitability

When designing a mechanism environmental integrity is a core principle, however, an expensive one for market actors. “Ambitious” baselines, requirements to achieve net mitigation, and overly strict conservativeness go hand in hand with a loss of revenue for market actors, depending on the value of the certificates (opportunity costs). Limited opportunities to trade units or credits (e.g. limitation to domestic trading only) could foil the benefits of economic instruments.

8 Practicability

Market participants will find a mechanism or approach the more challenging, the more cumbersome and burdening participation becomes. While it is normal to develop the respective capacities and get used to an instrument, overly complex and demanding requirements can undermine the practicability of any approach right from the beginning. The introduction of simplified rules for small and microscale projects under the CDM is a good example for how a mechanism can be adapted to market participants’ reaction (and resistance) regarding modalities and procedures.

8.1. Mode of participation

Implementing sectoral approaches results in different interactions between governments and market participants. Participation under the CDM or NAMAs for instance is entirely voluntary, while domestic measures such as the EU ETS or regulatory measures are mandatory. SCM and even more STM may require that participation is compulsory (depending on the government’s translation and application of rules to the domestic level), creating a new set of challenges. Certain actors such as auditors or technical experts could be required to get accreditation through a central authority, e.g. an Accreditation Panel related body.

8.2. Capacity

How complicated is the mechanism or instrument for market actors? In case of voluntary participation this can become a decisive aspect, as transaction costs for the implementation level (i.e. emitters, project developers) can easily exceed the level of incentives and thus become prohibitive barriers. This aspect is assumed to become more problematic in an increasingly fragmented landscape of mechanisms and approaches. Capacity building activities need to be of good quality and result in sustainable effects and recipient ownership. Otherwise one will waste financial and personal capacity.

6.2 How to overcome challenges for implementing sectoral approaches

In a second analytical step, we develop a catalogue of possible actions that promise to be effective in order to overcome the challenges which the previous section has raised. As several interviewees responded, one promising strategy for further evolution of sectoral approaches is not only to focus on progress in the UNFCCC negotiations, but also to gain practical experience from piloting activities that are related to the various aspects that define sectoral approaches as defined by the indicator-based evaluation in chapter 5. Moreover, it is important to recognize that some precedents that closely resemble such approaches already exist, even though they may be implemented outside the formal label of sectoral approaches. Therefore, for each of the respective stakeholder groups (UNFCCC; national governments, market participants) we propose options to overcome these challenges that focus both on UNFCCC negotiations as well as practical implementation. These options are presented in a table which lists the challenges raised above, and offers briefly described solutions. Due to the vagueness of sectoral approaches to date, these are very encompassing and are intended to serve as a basis for discussion rather than drawing up elaborate or fine-grained solutions.

Table 9: Catalogue of solutions for challenges to sectoral approaches

Nr	Issues	Challenges	Proposed Solutions
	UNFCCC		
	Common rules and standards	1.1. Finding agreement on the degree of centralization 1.2. Negotiating net mitigation and “own contribution”	<ul style="list-style-type: none"> - COP could consider expansion of CDM EB competences and mandate for NMM and/or other sectoral approaches - COP could establish a new governing body for NMM - COP could agree on principles and rules that would allow to transfer regulatory authority to UNFCCC external bodies: <ul style="list-style-type: none"> o Either a designated national government body in host country, registered with UNFCCC in order to avoid unclear and or overlapping responsibilities o Or international body that oversees a “sector” (e.g. ICAO, IMO) or other sector-specific associations (e.g. for the steel industry) - Seeking synergies between changes to CDM M&P and the development of NMM M&P CDM approaches <ul style="list-style-type: none"> - Further work on improving relevant CDM elements (<u>conservative</u> standardization of baselines, additionality and MRV has already strengthened sectoral approaches within the CDM) - CER cancellation has become a prominent issue in the ADP which can be used to account for net mitigation by tracking the origin of CERs. However, cancellation raises the challenge of generating financing as well as for administrative and eligibility requirements that need to be met in order to avoid double-counting. - CDM M&P reform regarding the length of the crediting period touches on net mitigation, although this is dependent on technology

		<p>Alternative approaches</p> <ul style="list-style-type: none"> - Discounting approaches are technically easier to implement and allow for a broad range of differentiation by technology or country criteria based, with a high degree of transparency - Establishing a distinction between the BAU scenario (based on country circumstances) and a more ambitious threshold value. Crediting would then take place only between the ambitious threshold and project emissions, whereas the difference between BAU and the ambitious threshold constitute the net mitigation part (The JCM has begun to pilot a conceptually interesting model for this approach, although its integrity depends strongly on the stringency of its implementation)
	<p>1.3. Fragmentation and need to integrate UNFCCC-external developments</p>	<p>Bilateral approaches</p> <ul style="list-style-type: none"> - Fragmentation could theoretically be seen as an opportunity if innovative approaches can be piloted, provided a sufficient level of environmental integrity is guaranteed. This requires that there is accountability towards UNFCCC, e.g. through guidance and authority of the COP (see also 1.1.), <p>UNFCCC external approaches</p> <ul style="list-style-type: none"> - For different sector-specific mechanisms, COP may require support structure (similar to CDM working groups), which allow for a technical understanding - If not possible, clear criteria and oversight, or discounting of UNFCCC external initiatives could become relevant
	<p>1.4. Safeguarding the environmental integrity of certificates</p>	<ul style="list-style-type: none"> - Credible UNFCCC oversight: guidance and authority of COP needs to be sufficiently robust, and include accountability provisions between decentralized regulatory entities and UNFCCC - Common accounting systems and criteria for eligibility and baseline are potential approaches - Voluntary standards may be able to mark certificates and thus allow for differentiation

2	Issuance of certificates	2.1. Defining the nature of certificates	<p>that rewards high quality approaches</p> <ul style="list-style-type: none"> - Buyer liability (need to replace deficient credits, concept used in WCI) could be used to force buyers to carefully assessing quality of certificates. Provisions and criteria would need to be defined at UNFCCC level (e.g. as part of FVA) - - All units should be defined as GHG units; units for other outputs (e.g. EE) should be convertible to GHG emissions, and thus be made fungible with other units - UNFCCC could act as gatekeeper, as high quality is critical for fungibility and tradability
		2.2. Lack of clarity on who has the authority to issue credits, and on what basis	<ul style="list-style-type: none"> - Certificates could preferably be issued directly through a direct representatively composed UNFCCC body, accountable to the COP, based on common rules and the support structure of the UNFCCC Secretariat (adjusting the current CDM support structure to new responsibilities) - If this is not politically palatable with some parties, a designated national body could issue credits. Ideally, it's fundamental rules would be based on common design principles, reports to the UNFCCC and include some gatekeeping and/ or accountability provisions.
		2.3. Lack of mitigation mechanism "infrastructure"	<ul style="list-style-type: none"> - Adjust roles of CDM project cycle and support structure, including UNFCCC Secretariat as well as working groups (e.g. to assess integrity of baselines). Depending on the role of this support structure, such operations are likely to require that fragmented mechanisms would need to be levied in order to cover costs. - Adjustments to the functionality of the CDM registry, as well as potentially operational rules and procedures for external registries and their link with the CDM or other UNFCCC registry. - If CER cancellation becomes more important as currently discussed in the ADP, specific host country accounts within the CER cancellation account could be established in order to track mitigation efforts and prevent double counting.

3	Lack of demand and market oversight	3.1. Lack of mitigation ambition leads to “underdemand”	<ul style="list-style-type: none">- Progressive countries should work towards a higher level of mitigation ambitions, through raising mitigation targets, as well as piloting. This includes the EU.- Targeted support for innovative high-quality CDM activities in desirable sectors and regions that contribute to further evolution of the CDM’s methodological toolkit and regulatory framework (similar to existing Ci-Dev or Future of the Carbon Market Foundation)- Advanced developing countries could create further demand through offsets for domestic ETS or carbon taxes- Build acceptance for CERs in emerging mechanisms including the aviation MBM- Transitioning key high-impact (sub)sectors such as HFCs and N₂O to non-offset mechanisms would allow to achieve cost-efficient net mitigation based on operational (CDM) methodologies and reduce supply from the CDM.
		3.2. There is an “institutional vacuum” for containing certificate price volatility	<ul style="list-style-type: none">- Work towards better understanding and higher acceptance of price stabilization measures in order to contain CER price depression and volatility- Proposals for a CER reserve (UNFCCC 2014) could contribute to market stability (in addition to mitigating other risks such as liability or permanence of credits) should be analyzed for their potential to be embedded in the emerging institutional landscape for climate finance (e.g. GCF).
National Governments			
4	Governing National Implementation	4.1. Balancing global and national responsibilities	For sectoral approaches with multilateral regulatory bodies (CDM+, NMM) <ul style="list-style-type: none">- Building on new roles in CDM standardization, explore whether DNAs or other government bodies will have certain responsibility and expand support for DNAs to understand and practice new responsibilities e. g. in CDM standardization- For regions and DNAs with less resources, the approach taken in CDM regional collaboration centres could be extended to also cover sectoral approaches. This could begin immediately with efforts that focus on scaling up PoAs to NAMAs, and be extended to other innovative sectoral approaches

			<p>For sectoral approaches with national regulatory body (FVA)</p> <ul style="list-style-type: none"> - Accountability towards UNFCCC as precondition for eligibility to generate compliance-grade certificates (please also refer to (1))
		4.2. Capacity constraints	<ul style="list-style-type: none"> - Capacity development and technical assistance can contribute to safeguarding a certain regional balance as a key factor for the legitimacy of emerging sectoral approaches (need to be done sustainably) - Global standardization can reduce the need to build domestic capacity, although there may be trade-offs with adequately addressing specific country circumstances - DNAs and other national bodies may need to introduce fees for their services in order to allow for the operations and to cover the costs of extended responsibilities
		4.3. Vulnerability to lobbying	<ul style="list-style-type: none"> - Transparency such as publicly available methodological approaches, easily accessible documentation, public commenting periods, and other measure to safeguard environmental integrity - UNFCCC oversight and accountability as a part of the checks and balances
5	Incentive Setting	5.1. Is it attractive for a country to participate in sectoral approaches?	<ul style="list-style-type: none"> - Most importantly, this depends on finding solutions for under-demand (see 3), as this is a precondition for sufficient value of certificates - The co-benefits of advanced technologies can be a strong pull factor towards mitigation mechanisms (e.g. health impacts, reduced pollution e.g. from fossil fuel combustion) - Building certainty for long-term mitigation goals and the relevance of the climate regime

		5.2. How to define, measure and implement net mitigation and “own contribution”	<ul style="list-style-type: none"> - This is required only if there are no centralized rules e.g. for establishing baselines and additionality on global (UNFCCC) level - Capacity building for improved understanding of domestically adjusted methodological elements (e.g. additionality, ideally building on top-down defined approaches and rules)- (see also 1.2)
		5.3. Lack of access to finance	<ul style="list-style-type: none"> - Access to finance can be facilitated by targeted public finance (including through MDBs) that underwrites and/or mitigates investment risks in developing countries (GCF is considering such instruments, which is another instance of the potential linkages between carbon markets and climate finance) - Raise awareness within the mainstream financial sector for GHG emission certificates as legitimate assets
		5.4. Sustainable development	<ul style="list-style-type: none"> - Consolidating the concepts and criteria that DNAs are using in the CDM context - CDM SD tool can be improved - Screen specific provisions for sectoral approaches such as NAMAs which often aim at “transformative effects” as an eligibility criterion - The insistence of a country’s right to self-define SD impacts domestically based on the principle of national sovereignty, however, cannot be circumvented
		6.1. Governance structure for certificate issuance	<p>This challenge is only relevant if national governments have the authority to issue credits</p> <ul style="list-style-type: none"> - Preference should be given to “neutral” multilateral bodies (ideally under the direct authority of the COP) - In case national governments directly issue credits, there needs to be a minimum lev-
6	Certificate Issuance		

		<p>el of UNFCCC oversight that needs to be guaranteed. National bodies with broad mandates have not performed well e.g. in JI. JCM and WCI propose bilateral agreements as gatekeepers between buyer and seller country, however, without moderating “neutral” international regulatory body, this can be seen as a risk for environmental integrity</p> <ul style="list-style-type: none"> - Possibly UNFCCC could accredit national issuance bodies for short periods of time (1-2 years) only, which could be renewable in case of diligent and credible implementation. However, it may be politically difficult to enforce compliance. - Transparent rules for how to establishing sector-specific baselines and other methodological elements, for how certificates are generated and issued or directly applicable default values
		<ul style="list-style-type: none"> - Depends strongly on design and feature of units, possible ways of mitigation risks include visible differentiation between different sectors, which allow buyers to select high quality approaches and mechanisms
	6.2. MRV	<p>Independent checks and balances of CDM need to be preserved:</p> <ul style="list-style-type: none"> - UNFCCC should determine competences of auditory and necessary work steps that need to be performed - Accreditation could then take place on national level (if desired), based on global rules - Definition of responsibilities of national level and implementing entities (emitters) - Reporting could be integrated into BURs
	6.3. Need to define “host country liability”	<ul style="list-style-type: none"> - Lessons from DOE liability from PoA context needs to be carefully analyzed - Host country liability would operate on larger scale and be more politically sensitive - “Insurance”-type of approaches operating with certificate reserves acting as buffer accounts, e.g. as proposed in a recent technical paper for changes to CDM M&P could be an important and “apolitical” function of a future global institutional architecture for market-based approaches, and offer linkages with issues related to market oversight and climate finance (see 3.2.)

Market Participants and Investors			
7	Incentive structure	7.1. Credibility of incentives	<ul style="list-style-type: none"> - Can be mitigated through strengthened rules for MRV of support to enhance transparency - Building trust: Dependent on progress of evolution of post 2020 climate regime (design of mechanisms on the international level, the lack of ambition and demand for credits, and the credibility of the national government).
		7.2. Need for investment certainty	<ul style="list-style-type: none"> - Stabilization of certificate value requires active market oversight (see 3.1.) - Requirements differ strongly by (sub)sector, mitigation and transaction costs
		7.3. Balancing trade-offs between net mitigation and profitability	<ul style="list-style-type: none"> - Conservativeness should be safeguarded through neutral checks and balances at multilateral level, but prevent excessive rigor that would produce too many “false positives” (Interview 4) - Higher level of conservativeness of standardized methodological tools allows for applicability in broader range of countries: easing use, reduces transaction costs - A more innovative results-based approach could blend the use of existing market mechanisms climate finance instruments. For instance, provision of upfront finance could be made subject to the condition to retire a corresponding share of the resulting CERs in the CER cancellation account, which would lead to immediate net mitigation impacts
8	Practicability	8.1. Mode of participation:	<ul style="list-style-type: none"> - Voluntary participation in sectoral approaches would increase acceptance and ease implementation - compulsory participation in sectoral approaches would potentially increase effectiveness and prevent leakage, but be subject to stiffer resistance - Both varieties could employ an adjusted CME-CPA relationship to a new type of interaction between public and private sector (regulating and implementing entity), e.g. through standardized templates for “CPA” integration and contractual conditions

		8.2. Capacity <ul style="list-style-type: none"> - Evolving sectoral approaches can immediately draw on operational improvements of the CDM. Further conservative standardization of CDM tools (baselines, MRV) reduces R&D costs - Top-down standardization reduces transaction cost on host country level and fragmentation for market participants - Capacity building activities must be designed sustainably, otherwise they may have contrary effects
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7 Conclusions & Recommendations

7.1 Conclusions

This study provides a comprehensive analysis of the evolution of existing sectoral approaches within the CDM, as well as emerging sectoral approaches such as sectoral crediting and trading, and other measures and policies that are relevant for NMM, FVA and NAMAs. The analysis offers a multi-dimensional perspective on these approaches, which has allowed us to define critical challenges and possible solutions for their further evolution, both within the CDM and within emerging mechanisms.

Key findings of the study include that some sectoral approaches have evolved from a theoretical discussion to practical implementation within the CDM (SBs, PoAs). After many years of conceptual debate, these approaches have become fully operational and have visibly influenced the CDM portfolio. In line with the CDM Policy Dialogue's recommendation cited above, our findings strongly suggest that further reform of various elements of the current CDM, including standardization of baselines, additionality and MRV, in combination with programmatic approaches could move the CDM closer towards some of the objectives of sectoral approaches that are now primarily discussed in the context of new mechanisms. It is important to recognize that the evolution of these existing sectoral approaches is still in a rather early stage, and the realization of their full potential is inhibited by the under-demand for CERs as a lack of mitigation ambition, which is a far cry from the scientific recommendations on what is necessary to achieve the 2° C goal.

The sectoral approaches found in the CDM are also highly relevant as methodological elements for emerging mechanisms. Still, other concepts such as policy crediting have moved to new debates on future mechanisms. It is becoming clear that sectoral approaches are likely to be implemented in a broader range of market and non-market mechanisms than the currently relatively coherent CDM, which was initially designed as a technology-neutral mechanism that was open to any sector. Although these concepts remain primarily theoretical as of yet, first practical examples are beginning to be explored, e.g. in the context of PMR. Some progressive developing countries have already moved even beyond sectoral approaches by as they are considering establishing multi-sectoral ETS – possibly in combination with domestic offsets based on the CDM. This is another indication of the wide range of possible uses of existing operational frameworks. In addition, political dynamics inside and outside of the UNFCCC process suggest that some subsectors may transition entirely away from the CDM (industrial gases). Other sector-specific mechanisms such as REDD are moving closer to becoming operational, while others remain in embryonic stages of development (aviation).

This increasing diversity of sectoral approaches and mechanisms results in a larger degree of fragmentation within the carbon market and the overarching climate regime. This requires understanding and highlighting the potential trade-off between flexibility for sector and host country contexts and environmental integrity and the ability to govern this architecture effectively. It remains an open question whether and how the FVA will be able to credibly coordinate this “devolution” in the climate regime. Despite the high level of uncertainty in anticipation of the 2015 climate agreement, our interpretation of the relevance of different drivers towards centralized and decentralized institutional designs suggests that – just like the overarching climate regime in which they are embedded – sectoral approaches and market mechanisms are headed towards a hybrid

architecture. This means that centralized mechanisms such as the CDM, and possibly the NMM will co-exist with more decentralized vehicles coordinated by the FVA. Still, in order for these approaches to contribute to the ultimate objective of the convention, and as a dominant majority of our interviewees urged, environmental integrity needs to remain at the key principle of this more diverse set of sectoral approaches. This conclusion draws attention to the role of effective governance arrangements which can deliver credible oversight.

In order to consolidate these findings, we attempt to contribute to adjusting the terminology that is used for various sectoral approaches in order to capture these important recent developments and the differences between them. The observations made in the analysis above suggest that at least three ideal types of sectoral approaches have been emerging, based on the approaches that have been discussed:

- ▶ **Sector-oriented approaches:** take into account entire (sub)sectors, for instance by developing mandatory SBs. These approaches still operate on a crediting basis, which may include projects, programmes, and even policies such as renewable energy feed-in tariffs (REFIT). Yet, due to their voluntary nature, they may not necessarily cover all emitters in a country or sector.
- ▶ **Sector-wide approaches:** refer to approaches that scale up mitigation action by covering entire (sub)sectors, e.g. by relying on PoA approaches. Yet, compulsory participation ensures complete coverage within the respective subnational, national or regional contexts. Likely early examples could include an STM or SCM approach that is targeting e.g. emissions-intensive industries.
- ▶ **Sector-specific approaches:** refer to mechanisms that are designed specifically for (sub)sector or even a single technology with highly idiosyncratic features, e.g. REDD, HFCs, aviation, shipping), and may operate across multiple countries. “Sector-specific” can imply broader definitions of sectors (energy, forestry), or also narrower subsectors (HFCs as subsector of industrial gases, coal power as subsector of industrial EE). A potentially high degree of net mitigation could be achieved if these mechanisms – in particular those with very low costs per tCO₂e reduced – can be transited away from offsetting.¹⁶

7.2 Recommendations

While the above analysis was able to evaluate on recent developments regarding sectoral approaches within the climate regime, it was not able to fully elaborate on certain aspects, such as in general the added value of new mechanisms compared to a reformed CDM+ with changed modalities and procedures. It also is beyond the scope of this study to provide solutions for solving the deadlock in the climate negotiations on the NMM or showing opportunities for avoiding a strong fragmentation trend away from the NMM towards the FVA. Here, it needs to be further assessed which incentive structures could convince countries and market participants to engage in potentially transformative interventions in key sectors of their economies.

Section 6.2. has already proposed solutions to some of these aspects, based on the previous analysis. In order to establish the link between the previous analytical exercise above – which sometimes consciously does not factor in political feasibility in order to

¹⁶ One of the few positive aspects of the current market depression is that it makes this more feasible as there are no perceived losses by project owners.

explore a broader range of possible concepts – and the UNFCCC negotiations we also propose a set of recommendations for further research and potential input to the UNFCCC debate and negotiations on sectoral approaches:

Research and practical piloting

Further research into emerging sectoral approaches can allow better understanding recently emerging trends:

- ▶ Enhance and promote increased CDM standardization due to the particularly high applicability for both the CDM and emerging mechanisms. This could also contribute to strengthening the role of the CDM versus UNFCCC external mechanisms, and ensure that the methodological tools of the only fully operational market mechanism are preserved.
- ▶ Approaches that scale up PoAs to NAMAs, in particular with regard to differences in MRV and incentive structures. This applies particularly to subsectors such as efficient household appliances or transport, which aggregate a large number of individually small mitigation actions and therefore require more complex conceptual designs. A specific research direction that captures recent debates could be to assess the pros and cons of policy crediting under an NMM versus NAMA crediting approaches.
- ▶ In general, an analysis of the potential and role of NAMAs with sectoral character: This could cover sectors that are feasible for full coverage through NAMAs, and an assessment of the existing NAMA pipeline.
- ▶ The roles and responsibilities of host country governments in sectoral approaches, and their relationship with the UNFCCC level needs to be much better understood. This could be pursued by investigating further lessons from the evolving CDM, but also of JI for NMM and FVA, in particular with regard to problems that are related to the authority to issue credits by the host country without strong multilateral oversight. Host country liability has received little attention until now, but our research indicates that this may become a major issue that could take years to resolve once sectoral approaches begin to be operationalized.
- ▶ Consider linkages between carbon markets & climate finance, including sector-specific RBF mechanisms based on CDM methodologies, as well as provisions to mitigate carbon price volatility, including through institutional linkages to the GCF. Such studies could focus specifically on:
 - ▶ CER cancellation as a RBF mechanism, in particular for those sectors and project types with high mitigation impact (HFCs) or high sustainable development impact. This can also lend a lifeline to struggling “good projects”, and thereby contribute to restoring trust in UNFCCC mechanisms.
 - ▶ Exploring designs of a CER reserve and possible functions, including price stabilization and serving as a buffer account to ensure against liabilities in case of significant deficiencies (proposed for DOE liability in the context of PoAs), which could in the future potentially also become relevant for host country liability. An additional function could be to act as a buffer account for land use and forestry projects that are still subject to highly unattractive restrictions related to the permanence of certificates in the CDM, even though voluntary carbon standards have generated operational alternatives.

- ▶ Support preparation and practical implementation of pilot activities for sectoral approaches in interested countries – these should closely build on the CDM (RBF) or other widely tested NMA approaches such as REFITS or REC schemes. A large number of interviewees stressed the importance of building practical experience as important complementary initiative to conceptual debates. Before starting the implementation of pilot activities, certain preparatory steps should be undertaken, such as scoping of sectoral action¹⁷ and potential opportunities, elaboration of practical policy concept notes and conduction of a stakeholder engagement process. In line with the political objectives of the UNFCCC process, such pilots should aim at balancing host countries at different levels of development, technologies and geographical regions.
- ▶ Assess the nuts and bolts of possible institutional linkages between UNFCCC and other international regimes and organizations such as Montreal Protocol (for HFC sector specific (RBF) mechanism), ICAO (aviation), IMO (shipping), e.g. with a focus on MRV, accounting and financing approaches.

Negotiations

In addition to our suggestions for further applied and academic research, the following recommendations for input to the UNFCCC negotiations can be derived from this study:

- ▶ Consider the potential of a “CDM+” as a complementary mechanism to NMM, FVA and NAMA:¹⁸ This could be done by establishing and assessing the linkages and potential synergies between the changes to the CDM’s modalities and procedures and the conception of the NMM modalities and procedures. The proposed changes to the CDM’s M&P do not consider sectoral approaches specifically, but aspects related to PoAs, DOE liability as a precedent for possible host country liability, extending approaches to assess additionality, and – with limitations – also the length of the crediting period as a possibly tool to achieve the net mitigation touch on issues that are also key to the design of the NMM.
- ▶ Regarding negotiations on the NMM/FVA:
 - ▶ Political progress requires further work towards mutual understanding among key parties. This is to a large extent hinging on trust related to the overarching issues of finance and mitigation ambition. Yet, practical experience and pilot activities of innovative approaches could contribute to make the concepts more tangible, and to building a supportive constituency in the implementing host countries.
 - ▶ In order to achieve the highest degree of effectiveness, further work on NMM M&P could focus on concepts that are clearly outside of the scope of the CDM’s M&P, e.g. exploring approaches for policy baselines as well as possible ways to define and quantify net mitigation, and make this politically palatable. This should also consider possible governance architectures,

¹⁷ Scoping of domestic opportunities is for instance done under the PMR.

¹⁸ The discussion often focuses on the notion that an NMM will succeed the CDM, which then may fade from the limelight. However, the progress of sectoral approaches within the CDM, the remaining length of possible crediting periods of the existing CDM pipeline, and particularly the CDM’s commonalities with many open issues that are now discussed in the context of new mechanisms, indicates that it would be premature to conclude that the CDM will necessarily fade away completely. This seems to depend most strongly on a sufficient level of demand of offset credits, which is a direct function of mitigation ambition.

i.e. the mandate and competences of the regulatory body and its accountability to both the UNFCCC and host countries.

- ▶ Support relatively progressive negotiation alliances such as AILAC, the LDC group, or others in formulating positions on (sectoral) market mechanisms.
- ▶ Regarding NAMAs, further work on MRV as well as drawing attention to the potential linkages between carbon markets and climate finance e.g. through CER cancellation as highlighted in the ADP, or through linkages with the Green Climate Fund (Private Sector Facility, different financial instruments, including for risk mitigation for private investment e.g. through sectoral approaches) could be explored.
- ▶ Regarding the consideration of UNFCCC external processes, e.g. as a platform for sector-specific approaches for industrial gases or aviation.
- ▶ Within the EU: strong advocacy is needed for the eligibility of international offsets both from the CDM and the NMM as a way to enhance mitigation ambition for the 2030 target. This could have positive effects on the negotiations, as well as on the ongoing deliberations within other key parties which are still in earlier stages of preparing their proposed “contributions”. Sticking to the exclusion of any international offset credits adds further policy uncertainty to the evolution of sectoral approaches in a highly sensitive market environment, and could be the final nail in the coffin of an embryonic NMM. CDM projects and PoAs can have lifetimes of up to 21 and 28 years, respectively, which makes it very difficult to communicate to Non-Annex I parties that have invested in the CDM, and are now requested to make further efforts for new mechanisms, why CERs should not be eligible for supplementary contributions to achieving 2030 targets. The CDM has demonstrated a significant level of responsiveness of reform demands, even though the politics have moved on by adding new demands. While this can be an important driver of further reform, achievements that have been made in response to earlier critiques should not be dismissed quickly, as valuable time, effort, and resources have been invested, which are just now beginning to be fruitful.

Finally, we stress again that at the most fundamental level, the most important precondition for effective sectoral market-based approaches is to increase the level of demand for certificates.

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Annex 1: List of Interviewees

Interview-No	Date	Interviewee	Category
1	20.01.2014	Latin American Climate Policy Researcher with market focus	experts / academia
2	23.01.2014	European UNFCCC negotiator	policy-maker
3	14.02.2014	European policy consultant	experts / academia
4	24.02.2014	climate policy advisor to industry	market participant
5	25.02.2014	European UNFCCC negotiator	policy-maker
6	25.02.2014	Multilateral development bank	market participant
7	26.02.2014	Climate Policy Consultant	experts / academia
8	03.03.2014	Climate Policy Consultant	experts / academia
9	03.03.2014	Market mechanisms expert	experts / academia
10	04.03.2014	Carbon market investor	market participant
11	05.03.2014	Latin American UNFCCC negotiator	policy-maker
12	07.03.2014	(former) Latin American UNFCCC negotiator	policy-maker

Annex 2: Overview of 2013 submissions with reference to sectoral approaches

NMM submissions				
Party / NGO	Statement contents	Type of statement	Page	Submission link
Alliance of Small Island States	The most promising broad segments of the economy for voluntary inclusion in sectoral trading or sectoral crediting under the New Market Mechanism would be those in which: (1) substantial emission reductions need to be achieved; (2) data is readily available; (3) the degree of uncertainty in emission estimates is low; (4) substantial potential to contribute to the host country's sustainable development is present; and (5) it can be shown that real and additional reductions in emissions that would otherwise have occurred to the atmosphere can be achieved.	Statement for „broad segments of the economy“	5	http://unfccc.int/files/cooperation_support/market_and_non-market_mechanisms/application/pdf/nmm_asis_12112013.pdf
	<p>These considerations support the creation of opportunities for voluntary developing country participation in sectoral trading and crediting approaches within the energy sector (power generation) and for industrial emissions (e.g., iron and steel production, cement production). The power generation sector typically has few players in each country, significant investments will be needed, and data is more likely to be readily available to governments than in other sectors. For certain industrial sectors, such as iron and steel production and cement production, reliable data is also likely to be available and opportunities for realizing emission reductions are well known.</p> <p>The transport sector may be amenable to inclusion in certain countries if sectoral boundaries can be established. The forestry sector may be more challenging to include, given the enormous data uncertainties in this sector, the large swings in annual emissions due to year-to-year variability in the climate, and the increasing likelihood of large-scale carbon stock losses due to the consequences of projected climate change itself.</p> <p>Policies that support emission reductions in the LULUCF sector or reduced emissions from deforestation and forest degradation (REDD) may benefit in the near term from non-market based financing mechanisms, or from a system that is clearly segregated from the trading of units representing emission reductions from the power generation or industrial sectors.</p>	Statement for „sectoral“	5	

Nepal	As indicated, the LDC Group believes that the NMM should apply to major emitting countries and should be based on economy wide quantified emission limitation or reduction targets.	Statement for „broad segments of the economy“	2	http://unfccc.int/files/cooperation_support/market_and_non-market_mechanisms/application/pdf/nmm_nepal_29102013.pdf
	Sectoral approaches should be applied within non market based NAMAs.	Statement for „sectoral“	2	
World Bank	<p>The prompt start phase should be inclusive in terms of participation requirements (e.g., countries with or without national GHG emissions caps, at different levels of readiness in terms of GHG accounting and tracking systems). It should cover broad segments of the economy while accommodating for new approaches for mitigation actions at different scales and scopes. This would effectively complement and support domestic efforts, starting with incentive schemes at the sub-sectoral, city-level, sub-national and national levels to domestic emission trading schemes and economy-wide instruments such as carbon tax or reform of fuel pricing. The prompt start phase should also recognize a variety of possible uses of emission reductions, including but not limited to the use for compliance against a pledge or target in another country. [...]</p> <p>The rules and provisions relating to the conservative baseline setting for broad segments of the economy, are further strengthened by the principle of achieving net emission reductions (through crediting thresholds and/or trading caps), and therefore should be considered as demonstrating additionality in an appropriate and sufficient way.</p>	Statement for „broad segments of the economy“	3, 5	http://unfccc.int/resource/docs/2013/smsn/igo/112.pdf

	<p>In the absence of clarity of the future architecture of the post-2020 agreement, a growing number of domestic initiatives are already shaping the landscape where developed and developing countries are undertaking efforts to design and implement market and non-market based instruments of climate policy. This reflects domestic objectives and priorities, and takes into account their particular circumstances (such as the socio-economic context, structure of economy and major emitting sectors, institutional capacity). These initiatives are seeking to introduce a domestic and/or international carbon price signal through a variety of instruments starting incentive schemes at the sub-sectoral, city-level, sub-national or national levels to domestic emission trading schemes and economy-wide instruments such as carbon tax or reform of fuel pricing.</p>	Statement for „sectoral“	2	
<p>IATP, IPS, TWN and Indigenous Peoples' International Centre for Policy Research and Education</p>	<p>The approaches considered by the framework should move beyond the failed carbon trading mechanisms and consider national non-market-based approaches, including policies and regulatory measures such as:</p> <p>[...]</p> <p>d) Direct compensation of net avoidance of emissions based on a programmatic and cross-sectoral approach.</p>	Statement for „sectoral“	6	<p>http://unfccc.int/resource/docs/2013/smsn/ngo/327.pdf</p>

<p>CMIA and PD-Forum</p>	<p>To stimulate mitigation across a broad segment of the economy, a wide range of sectoral benchmarks and reference levels should be proposed. Initial benchmarks could be set at levels that would enable rapid take up, while being fine-tuned and tightened soon after to avoid the creation of excess supply.</p> <p>It may be possible to extrapolate from sectors with large number of CDM/JI projects, or sectors where standardised baselines are currently being developed under the CDM. Also, several methodologies already use benchmarks, which could be used for NMM. While CDM baselines are often a conservative interpretation of “business as usual”, NMM sector baselines should include an own-effort element. As proposed above, we advocate accurate monitoring to derive the real reductions achieved from all approaches followed, and believe that the own-effort element should be quantified as the mitigation share. The mitigation share is further elaborated in our Carbon Market Architecture (annex 1) and a separate paper (annex 2).</p> <p>In principle all sectors may be covered in NMM, but data availability is likely to restrict the initial proposed sectors to those with the largest GHG emissions and greatest energy use. In practise, even after NMM is effectively running, smaller emission sources are likely to be covered under other approaches.</p> <p>Initially NMM could be proposed in some sectors with high emissions and large point sources, for example the power sector, cement, iron and steel, fertiliser, etc. It would seem unlikely that there is one single NMM, but rather there are various component NMM being proposed and being built up over time, with some sectors and countries graduating from the other approaches.</p>	<p>Statement for „broad segments of the economy“</p>	<p>10</p>	<p>http://unfccc.int/resource/docs/2013/smn/ngo/324.pdf</p>
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	<p>The COP's definition of NMM is still very broad. We understand that NMM are sector-based approaches using targets, benchmarks, standardised baselines or allowances. They key candidates for NMM should be large point sources or fossil fuel users, such as power plants, industrial sites, refineries, oil/gas flares, and possibly also planes and ships. Disaggregated or under-developed sectors are not suitable for sectoral schemes, for example the agricultural sector, but can be effectively addressed through the project-based approach of the CDM.</p> <p>[...]</p> <p>The COP's definition of NMM is still very broad. We understand that NMM are sector-based approaches using targets, benchmarks, standardised baselines or allowances. They key candidates for NMM should be large point sources or fossil fuel users, such as power plants, industrial sites, refineries, oil/gas flares, and possibly also planes and ships. Disaggregated or under-developed sectors are not suitable for sectoral schemes, for example the agricultural sector, but can be effectively addressed through the project-based approach of the CDM.</p> <p>New Market-based (allowance) Mechanism, i.e. cap-and-trade. Allowance-based NMM, providing even greater efficiency, should be limited to the capped environment or to constituencies with particularly strong enforcement capabilities. An example of an allowance-based NMM is a trading scheme such as the EU ETS. However, where the system operates under economy-wide targets or agreed (legally-binding) sectoral targets under the Durban Platform (see level 6 below), it would be unnecessary for this to be separately defined as NMM.</p>	Statement for „sectoral“	22, 24	
CEPS	<p>For the purposes of this paper NMM will be considered to include a Sectoral Trading Mechanisms and a Sectoral Crediting Mechanism.</p> <p>[...]</p> <p>Step 1 – COP 19 (Pilot Phase)</p> <p>1. Start developing the Modalities & Procedures for Sectoral Trading and Sectoral Crediting. This should be done in SBSTA. There are excellent submissions by Parties, especially the EU one, which can make the basis of negotiations going forward.</p>	Statement for „sectoral“	4, 16	http://unfccc.int/resource/docs/2013/smn/ngo/323.pdf

EDF	<p>Context for a framework: In previous submissions, EDF has proposed that any country that chooses to establish a binding commitment – under a clear transparency, compliance, and enforcement framework – to limit total GHG emissions on a national, subnational, or sectoral level (a “QELRC Party”), should be able to gain access to the global carbon market; countries that choose not to make a binding emissions limitation commitment would not participate in international carbon markets.</p> <p>[...] see Table 1 on page 6</p>	Statement for „sectoral“	2/3, 6	http://unfccc.int/resource/docs/2013/sm/sn/ngo/326.pdf
IETA	<p>While the CDM provides an important foundation for crediting mechanisms of the future, voluntary markets in many ways have additionally been the test beds of climate innovation and should also serve in a similar role as a crediting mechanism alongside the CDM—including REDD+ and frameworks for crediting REDD at both the jurisdictional and project levels; and the development and use of performance methods for crediting individual firm performance within a sectoral context. All new crediting mechanisms should build on the experience garnered through the CDM, including its MRV and standards.</p> <p>Any new crediting mechanism will have its inherent risks. In order to mitigate such risks, the mechanism should include a tool that provides a guarantee to private sector investors, at least in the mechanism’s early stages, against unacceptable risks. This could come in the form of an international body that provides a financial guarantee that such a system is safeguarded from policy and economic risks. A case can be made that the Green Climate Fund (GCF)—and/or the World Bank—could provide guarantees or insurance, or provide incentives to support pilot projects and investments, in order to attract and lead private sector investors into sectoral credit projects or other crediting mechanisms as they are introduced.</p> <p>Under certain circumstances, however, the host country could provide the guarantee. Pilot projects and real experiments are key to progress towards new crediting mechanisms. Also we expect that the GCF will provide incentives to various mitigation and adaptation projects- depending on the amount and scale of public and private financial commitments.</p>	Statement for „sectoral“	7	http://unfccc.int/resource/docs/2013/sm/sn/ngo/330.pdf

EU	<p>24. Recalling the principle of stimulating mitigation across broad segments of economy (paragraph 80 (d) of the decision 1/CP.16), the EU wishes to reiterate the importance of agreeing on a common approach to define the broad segment of economy.</p> <p>25. Regarding “Broad segment of the economy” the EU envisage that this would mean one or more sector, category or sub-category listed in Annex II of the UNFCCC guidelines on reporting and review, as adopted by the Conference of the Parties in decision 15/CP.17.</p> <p>26. The EU envisages two basic forms of implementation of the NMM: crediting and trading, which both cover broad segments of economy and can be described as sectoral approaches.</p>	Statement for „broad segments of the economy“	5, 6	http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/nmm_eu.pdf
	<p>27. The Implementing Party should determine in its initial report one or more sectors, categories or sub-categories which should be included in the Implementing Party’s broad segment of the economy.</p> <p>28. The Implementing Party may propose in its initial report to include one or more sectors, categories or sub-categories in the Implementing Party’s broad segment of the economy that diverge from the definition of sectors, categories or sub-categories pursuant to Decision 15/CP.17. For the purpose of carrying out the technical assessment of this proposal in the context of the initial report, the following criteria should be taken into account:</p> <ul style="list-style-type: none"> - the proposal must be sufficiently justified on the basis of, inter alia, the unsuitability of the definitions of sectors, categories and sub-categories pursuant to Decision 15/CP.17 and the need to avoid leakage and double counting; - alternative definitions must be clearly defined and relate to a specific product or service. Definitions should not relate to a specific technology. <p>29. If the broad segment of economy proposed does not have specific methodologies adopted by the IPCC for estimating GHG emissions, the proposal from the Implementing Party should include methodologies for the estimation of these emissions that should be approved by the IRT and the IC.</p>	Statement for „broad segments of the economy“		
	<p>26. The EU envisages two basic forms of implementation of the NMM: crediting and trading, which both cover broad segments of economy and can be described as sectoral approaches.</p>	Statement for „sectoral“	6	

Environmental Integrity Group	<p>The new market mechanism is designed in the context of efforts to raise mitigation ambition before 2020 and to ensure that the post-2020 climate regime will be robust and ambitious. Therefore, the new market mechanism need to scale-up mitigation action in comparison to the CDM and JI. Building on these experiences and as a means to complement the project-based approach, the new market mechanism need to scale up mitigation actions by facilitating their implementation on a broader scale, such as segments, sectors, subsectors or policies.</p> <p>[...]</p> <p>Guidance on common requirements for baseline setting for broad segments of the economy is needed, while leaving the responsibility to participating country Parties to propose adequate baselines, recognizing the host Party's own responsibility on mitigation.</p>	Statement for „broad segments of the economy“	3, 4	http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/nmm_eig.pdf
Morocco	<p>1) The post 2012 framework should consider new mechanisms that are market based or non market based to harness every single potential mitigation opportunity, with the purpose of achieving the overall objectives of preserving environmental integrity. It should include the sectoral, sub-sectoral and project-based approaches. However, it should be noted that economics should not prevail at the expense of environmental and social aspects.</p>	Statement for „sectoral“	1	http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/nmm_morocco.pdf
New Zealand	<p>8 We would also identify a number of other elements which should be considered as part of the new market-based mechanisms work programme, including:</p> <ul style="list-style-type: none"> - Application to all Parties; - <p>The relationship between new market-based mechanisms, the Framework and sub-national, national and regional mechanisms;</p> <ul style="list-style-type: none"> - The relationship between new market-based mechanisms and other mechanisms and institutions under the UNFCCC including international assessment and review (IAR) and international consultation and analysis (ICA); and - The kind of approaches ‘covered’ by new market-based mechanisms, for example project-based and/or sectoral crediting. 	Statement for „sectoral“	2	http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/nmm_new_zealand.pdf

Norway	Norway supports the development of a sector-based mechanism - covering broad segments of the economy - that encompasses a two-track system, one for crediting , where credits are issued ex post for emissions reduction achieved according to an ex ante defined crediting threshold, and one for trading, where trading units can be issued ex ante according to an ex ante defined emission cap.	Statement for „broad segments of the economy“	2	http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/nmm_norway.pdf
	4. The mechanism should provide a means to stimulate mitigation across broad segments of the economy, as defined by the participating Parties, including on a sectoral and/or project specific basis. [...] Unlike the crediting track, sectoral trading will set a cap up front, on emissions for sources within the given sector. The host Party, under this track, would establish the target(s) for sectors to be included under this track and report to a governing body. This track would function similar to Article 17 trading under the Kyoto Protocol. The host Party can sell emission reduction units before the reductions occur. A trading mechanism will therefore imply that the host Party will need to purchase reduction units for emissions above the cap. The trading track would probably be more suitable for segments of the economy where a host party has in place systems necessary to trade under a binding cap, and the level of guidance from any UNFCCC governing body for a trading track should take this into account. A sectoral crediting mechanism provides Parties with greater opportunity to reduce emissions within a sector while improving infrastructure, providing greater access to low carbon technologies and financing. Under this track, the host Party identifies appropriate sector(s) for inclusion in the mechanism; business as usual baselines are developed in accordance with guidance to be provided by an appropriate governing body. Also in this case the sector covered by the NMM has to be defined in a clearly and transparent manner in order to compare the ex post emission with the ex ante defined crediting thresholds. A stringent crediting threshold should be set below the business as usual baseline.	Statement for „sectoral“	1, 2	
Tunisia	The definition of the “broad segment of economy” is at the discretion of the host country; existing internationally agreed definitions such as the IPCC inventory guidelines may be applied. Common MRV and accounting rules will permit to avoid double counting.	Statement for „broad segments of the economy“	1, 2	http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/nmm_tunisia.pdf
World Bank	14. The prompt start phase should be inclusive in terms of participation requirements (e.g., countries with or without national GHG emissions caps, at different levels of readiness in terms of GHG accounting and tracking systems). It should cover broad segments of the econ	Statement for „broad segments of	3, 4	http://unfccc.int/resource/docs/2013/sm

	<p>tems). It should cover broad segments of the economy while accommodating for new approaches for mitigation actions at different scales and scopes. This would effectively complement and support domestic efforts, starting with incentive schemes at the sub-sectoral, city-level, sub-national and national levels to domestic emission trading schemes and economy-wide instruments such as carbon tax or reform of fuel pricing. The prompt start phase should also recognize a variety of possible uses of emission reductions, including but not limited to the use for compliance against a pledge or target in another country.</p>	the economy“		sn/igo/113.pdf
	<p>5. In the absence of clarity of the future architecture of the post-2020 agreement, a growing number of domestic initiatives are already shaping the landscape where developed and developing countries are undertaking efforts to design and implement market and non-market based instruments of climate policy. This reflects domestic objectives and priorities, and takes into account their particular circumstances (such as the socio-economic context, structure of economy and major emitting sectors, institutional capacity). These initiatives are seeking to introduce a domestic and/or international carbon price signal through a variety of instruments starting incentive schemes at the sub-sectoral, city-level, sub-national or national levels to domestic emission trading schemes and economy-wide instruments such as carbon tax or reform of fuel pricing. [...] 14. The prompt start phase should be inclusive in terms of participation requirements (e.g., countries with or without national GHG emissions caps, at different levels of readiness in terms of GHG accounting and tracking systems). It should cover broad segments of the economy while accommodating for new approaches for mitigation actions at different scales and scopes. This would effectively complement and support domestic efforts, starting with incentive schemes at the sub-sectoral, city-level, sub-national and national levels to domestic emission trading schemes and economy-wide instruments such as carbon tax or reform of fuel pricing. The prompt start phase should also recognize a variety of possible uses of emission reductions, including but not limited to the use for compliance against a pledge or target in another country.</p>	Statement for „sectoral“	2, 4	

IGES	<p>General views</p> <ul style="list-style-type: none"> - The IGES believes in the important role of market-based mechanisms as efficient and effective policy instruments to address climate change mitigation. - The design of new market-based mechanism (NMM) can complement existing Kyoto mechanisms by increasing its coverage to a broader segment of economy. - NMM should build on lessons learnt from Kyoto mechanisms, particularly the clean development mechanism. 	Statement for „broad segments of the economy“	1	http://unfccc.int/resource/docs/2013/smsn/ngo/340.pdf
CEPS	<p>To produce M&P for UN defined, approved and operated market mechanisms, which will stimulate mitigation actions across broad sectors of the economy, and may be project specific, or sectoral, in nature. This is somewhat surprising as there already are UN market mechanisms that operate on project-by-project basis (CDM and JI). It must be concluded that some Parties wish to continue to explore an organic link between the existing KP project mechanism and the broader sector approaches. Indeed, some feel that the existing CDM could be expanded and/or merged into the NMM.</p> <p>[...]</p> <p>7. For the purposes of this paper NMM will be considered to include a Sectoral Trading Mechanisms and a Sectoral Crediting Mechanism.</p> <p>[...]</p> <p>New Market Mechanisms</p> <p>NMM are envisaged to have a number of characteristics, with few of them enshrined right now in any decision text:</p> <ul style="list-style-type: none"> - The NMM will be mechanisms that will incentivize GHG reductions and will be designed, created and operated under the authority of the COP. If the CDM did not exist it could potentially be created as a NMM. - They will be sectoral in nature as UNFCCC and project-based, even if the project-based approaches already exist (CDM & JI). <p>[...]</p> <p>Step 1 – COP 19 (Pilot Phase)</p> <p>1. Start developing the Modalities & Procedures for Sectoral Trading and Sectoral Crediting. This should be done in SBSTA. There are excellent submissions by Parties, especially the EU one, which can make the basis of negotiations going forward.</p>	Statement for „sectoral“	3, 4, 6, 16	http://unfccc.int/resource/docs/2013/smsn/ngo/323.pdf

<p>CMIA and PD Forum</p>	<p>To stimulate mitigation across a broad segment of the economy, a wide range of sectoral benchmarks and reference levels should be proposed. Initial benchmarks could be set at levels that would enable rapid take up, while being fine-tuned and tightened soon after to avoid the creation of excess supply.</p> <p>It may be possible to extrapolate from sectors with large number of CDM/JI projects, or sectors where standardised baselines are currently being developed under the CDM. Also, several methodologies already use benchmarks, which could be used for NMM. While CDM baselines are often a conservative interpretation of “business as usual”, NMM sector baselines should include an own-effort element. As proposed above, we advocate accurate monitoring to derive the real reductions achieved from all approaches followed, and believe that the own-effort element should be quantified as the mitigation share. The mitigation share is further elaborated in our Carbon Market Architecture (annex 1) and a separate paper (annex 2).</p> <p>In principle all sectors may be covered in NMM, but data availability is likely to restrict the initial proposed sectors to those with the largest GHG emissions and greatest energy use. In practise, even after NMM is effectively running, smaller emission sources are likely to be covered under other approaches.</p> <p>Initially NMM could be proposed in some sectors with high emissions and large point sources, for example the power sector, cement, iron and steel, fertiliser, etc. It would seem unlikely that there is one single NMM, but rather there are various component NMM being proposed and being built up over time, with some sectors and countries graduating from the other approaches.</p>	<p>Statement for „broad segments of the economy“</p>	<p>10</p>	<p>http://unfccc.int/resource/docs/2013/sm/sn/ngo/336.pdf</p>
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FVA submissions				
Party / NGO	Statement contents	Type of statement	Page	Submission link
EU	<p>The EU believes that the COP should guide the definition of the Framework, including market based and non-market based approaches, to enable and secure a robust system that stimulates mitigation across broad segments of the economy while safeguarding environmental integrity. This would include common accounting rules and MRV requirements that would allow for the recognition of these efforts.</p> <p>[...]</p> <p>The EU further recalls the general principles relating to market-based mechanisms in the Cancun Agreement, including stimulating mitigation across broad segments of the economy, safeguarding environmental integrity and ensuring good governance and robust market functioning and regulation [Decision 1/CP.16, para 80].</p>	Statement for „broad segments of the economy“	1	http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/fva_eu.pdf
Environmental Integrity Group	<p>Baseline setting for broad segments of the economy, while leaving the responsibility to participating country Parties to propose adequate baselines, recognizing the host Party's own responsibility on mitigation; guidance should ensure that:</p> <ul style="list-style-type: none"> - Baselines are demonstrably below projected business-as-usual scenarios; - Conservative methodological approaches are applied when setting baselines and determining additionality, for example when using simplified approaches that would result in increased uncertainty; this includes taking into account that some mitigation outcomes can become common practice over time and should be included in the business-as-usual scenario after a specific period of time when the host Party carries out the periodical revision of the baselines (e.g. after 5, 7 or 10 years); - Perverse incentives at national levels to delay mitigation policies are avoided; - The length of crediting periods is adjusted when simplified baseline approaches that increase uncertainty are used; - Regular revisions of baselines take place. 	Statement for „broad segments of the economy“	3	http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/fva_eig.pdf
USA	<p>Information provided at the program level should include the following:</p> <p>(...)</p> <p>Types of mechanisms: Description of the types of mechanisms that are implemented (e.g., emissions trading system; type of offset mechanism, such as sectoral crediting, project-based, program-of-activities, credited NAMA, etc.).</p>	Statement for „sectoral“	8	http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/fva_usa.pdf

Coalition for Rainforest Nations	<p>6. The FVA should cover various approaches, domestic and/or international, including sectoral mechanisms, seeking international recognition, that result in net reductions of greenhouse gas emissions by sources and removals by sinks. [...]</p> <p>22. The new market based mechanism will be sectoral in nature and under the authority of the COP. It shall be used by Parties on a voluntary basis and taking into account national circumstances.</p>	Statement for „sectoral“	2, 6	http://unfccc.int/files/documentation/submissions_from_parties/application/pdf/fva_cfrn.pdf
IETA	<p>IETA proposes a stepwise approach to the goal of a global carbon market, through an arrangement that allows linkage between approaches within the FVA, utilizing existing market approaches and the New Market Mechanism to establish both initial supply and demand for carbon pricing units. A national, sub-national or sectoral level approach recognized under the FVA may choose multilateral participation in the developing global carbon market by accepting a fixed carbon emissions budget for a given future period in the form of tradable international allowances (an FVA unit, or FVU). [...]</p> <p>While the CDM provides an important foundation for crediting mechanisms of the future, voluntary markets in many ways have additionally been the test beds of climate innovation and should also serve in a similar role as a crediting mechanism alongside the CDM—including REDD+ and frameworks for crediting REDD at both the jurisdictional and project levels; and the development and use of performance methods for crediting individual firm performance within a sectoral context. [...[weiter Seite 7:</p> <p>A case can be made that the Green Climate Fund (GCF)—and/or the World Bank—could provide guarantees or insurance, or provide incentives to support pilot projects and investments, in order to attract and lead private sector investors into sectoral credit projects or other crediting mechanisms as they are introduced.</p>	Statement for „sectoral“	4, 7	http://unfccc.int/resource/docs/2013/smsn/ngo/330.pdf